

MODERN PLASTICS

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DECEMBER, 1935

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W. S. LANDES

NEXT MONTH

Mr. W. S. Landes, president of the Celluloid Corporation, will reveal his personal opinion about the future prospects of cellulose plastics (acetates and nitrates) which first gave us Celluloid collars, then photographic film and now so many other useful things we can't begin to remember them all.

Hotels and night clubs are again busy to the point of being rushed so we will show several of those whose smart decorations depend upon laminated plastics for interesting effects.

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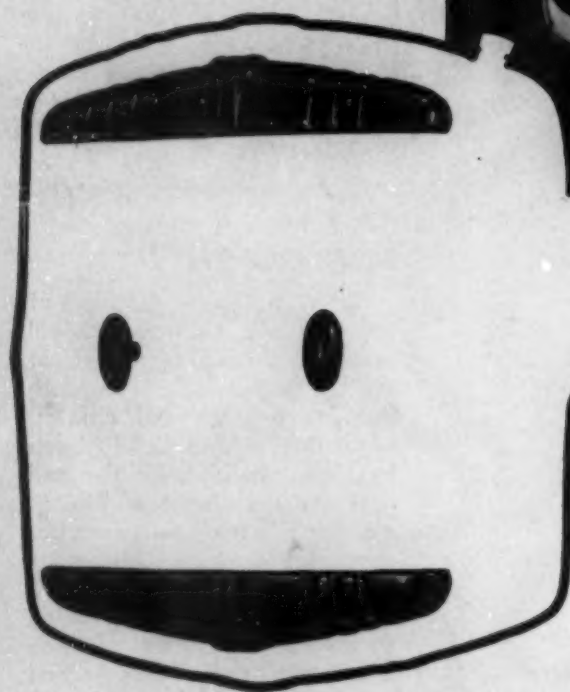
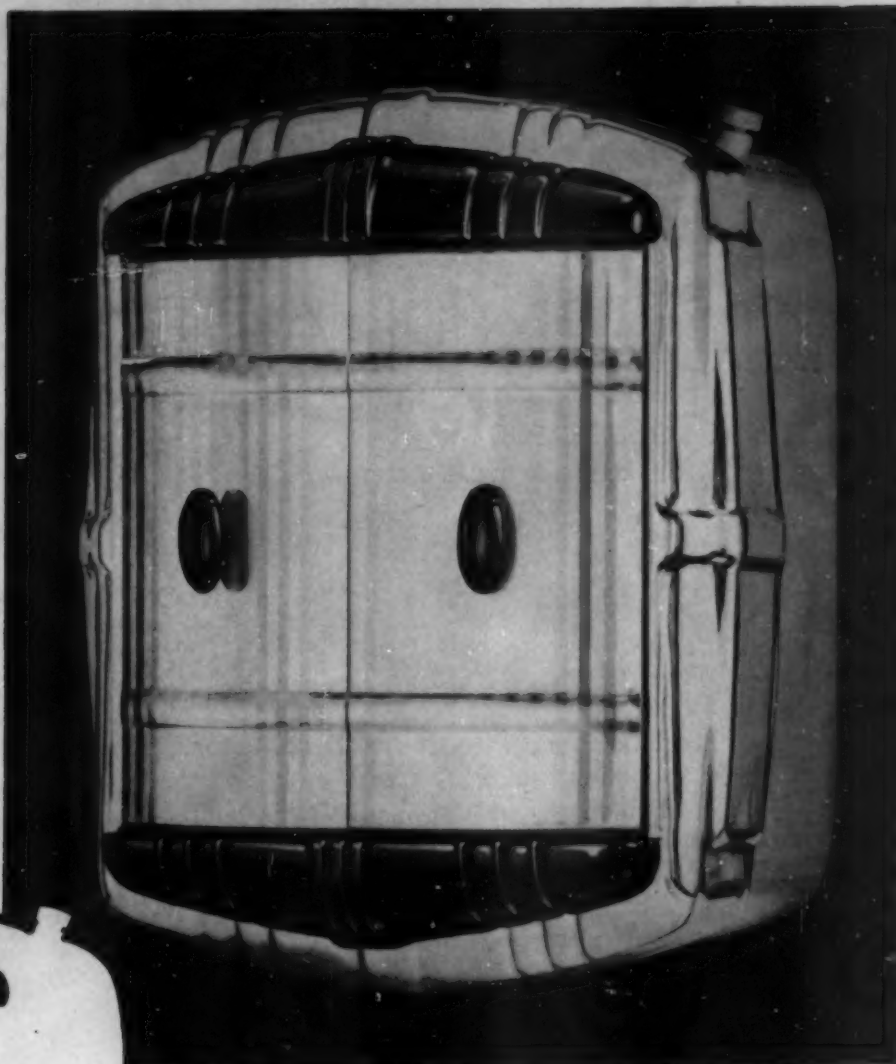
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The Perflex Radiator Company of Milwaukee, Wisc., has used Resinox for the embellishment of their beautifully designed and efficient Perflex hot water automobile heaters. The Resinox parts were molded by W. Van Norman of Chicago.

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MODERN PLASTICS

BRESKIN AND CHARLTON PUBLISHING CORP.

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Automobile gossip from the National Show

BY E. F. LOUGEE



THE glistening new cars of 1936 with their toboggan backs and hundred-mile speedometers have long since whizzed away to their show rooms or wherever they go when the Automobile Show is over. Porters have swept up cigar ashes at the Waldorf and Astor and put chairs back where they belong. Tired executives and engineers have returned to Detroit to catch up on their sleep, and salesmen have gone home to put on clean collars and by this time are no doubt chasing up prospects revealed at the show.

Grapevine reports preceding the show led us to expect that cars would appear with molded plastic radiators, fenders and whatnot but as usual we found these reports somewhat exaggerated. Plastics are being used, however, in very sensible applications and before another year rolls around they will appear in a number of yet unheard of places. We gather this from direct personal contact with a number of executives and engineers to whom we devoted the entire Show week (mostly in hunting for them). That these gentlemen are thinking plastics and talking them, there is no doubt. We found no individual without rather definite ideas on the subject. Some of them right, some wrong, but all interesting.

The Hudson Motor Car Company was really among the first to use plastic materials in automobile construction according to Frank S. Spring, engineering stylist of the company. As early as 1929 it experimented with an outside door handle of molded material (the exact type of material could not be recalled) but the idea was discarded when experience proved that the material became dull and discolored

after a short time. No recent experiments with molded phenolics for this purpose have been conducted. However, the year 1931 marked the beginning of the use of plastic knobs on chokes, window regulator handles, etc.,

which have been found to be eminently satisfactory. Escutcheon plates of plastic appear this year on all Hudsons because they give a more pleasing appearance to interior decoration and add prestige. Although plastic escutcheon plates are no more expensive than metal, they are not being used on Terraplanes for the simple reason that a price differential must be maintained between the two cars and metal is considered more appropriate for the less costly cars. Both Hudson and Terraplane cars are equipped with steering wheels of Tenite and horn buttons are of colored material to match. Light colors are used and if the garage man leaves the wheel soiled and greasy, it is instantly visible and may be cleaned before it has a chance to soil gloves or hands of the driver. Women drivers especially appreciate this and it is reported to be a good selling feature for the car. A bright red cast resin radiator ornament will serve to identify Hudsons and Terraplanes on the road—at least until someone else starts using a similar identification, then some new device will be designed.

Chrysler, De Soto and Dodge make good use of plastics for interior decorative spots, particularly where color is a factor. Knobs, escutcheon plates and ash trays in the new models are largely of Tenite and apparently these ideas have generated from the common application of similar material to objects which have become familiar in the home. "We find



Interior of the 1936 Hudson car showing steering wheel, control knobs and window adjusting handle with knob and escutcheon of Tenite. At the left are radiator ornaments of Catalin used both on Hudsons and Terraplanes

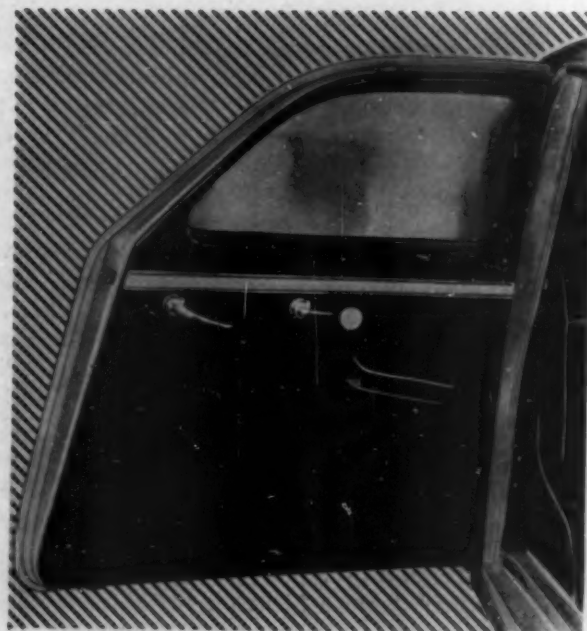
plastics particularly suitable," says Oliver Clark, Chrysler engineer, "for the ends and covers of our concealed ash trays in the arms of the rear seats as well as for ash trays on the sides of cars." Instrument faces on De Soto cars have become very decorative through the use of enameloid cloisonné.

Cord, one of America's more expensive cars and a recognized leader in advanced design, uses plastic knobs and gadget handles rather profusely. A decorative strip of plastic material is used for paneling the doors of the closed models, which continues the full length of the car with pleasing effect.

The Bugatti, a diminutive car of unmistakable Continental flavor, made in Italy, uses plastics for all its controls. Its instrument panel is of resin impregnated plywood which gives its surface the feeling and durability of plastics combined with the natural graining of beautiful wood which has met with such popular public approval.

Turnstedt, the Detroit concern that supplies many automobile manufacturers with hardware, bumpers, radiators grilles, etc., used plastics as far back as 1926 but their early experience with molded plastics was more or less disappointing. They now use ureas instead of glass in the dome lights they manufacture and are experimenting with cast resins for a purpose they are not yet willing to disclose.

Delco-Remy, manufacturers of starting and lighting equipment, use plastics extensively for every possible functional purpose. "As the cost of plastics has come down," says F. C. Kroeger, general manager of that company, "the number of uses has increased until they have largely replaced fiber and other materials



wherever absolutely dependable insulation is required.

Although these represent the principal plastic parts being used extensively, our inquiry revealed that many other prospective uses have been thought of, talked about and experimented with by various manufacturers. Their views on the subject should be interesting to molders and fabricators. For instance,

Frank S. Spring, engineering stylist of Hudson Motor Car Co. suggests that inner door panels which hold the stops to regulate windows and door-lock mechanism, usually assembled through a series of parts and attached to the stamping, could as well be made of plastics and completed in one casting, substantially reducing the number of parts. The holes falling automatically into alignment would save time in assembling. This could be carried further by mounting all incidental parts on the back of a panel, thus doing away with some of the upholstery on the inside of the door. Possibly one-half or two-thirds of the door inside might be of plastic material which would not scratch even when kicked open.

Instrument panels are now welded into place, acting as a cross member to strengthen the construction of the car, but there is no reason why a plastic face plate could not be made to cover this cross member and serve as instrument faces in which the radio loudspeaker and control could be built all in one. This would save considerable time, for the wires could be mounted at the bench and such a procedure would be excellent from the standpoint of repair.

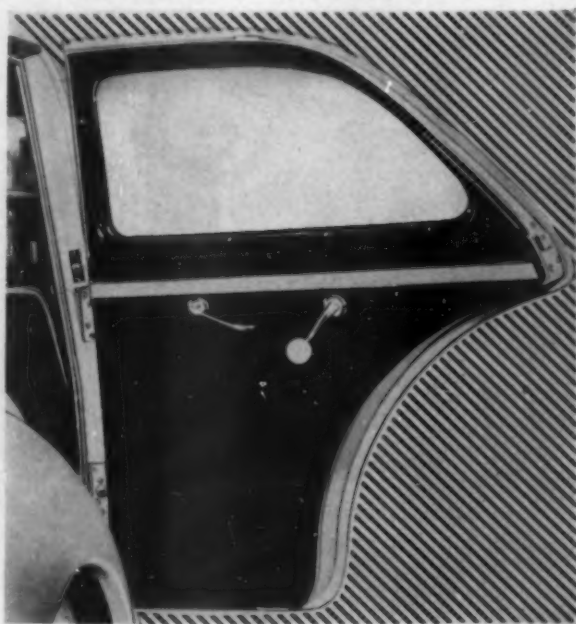
Under consideration at the present time is the trim. Because plastics still cost more than metal stampings, which are decidedly cheap, metal continues in use. Then, too, wood grain holds the popular fancy of the public and plain plastics or plain paint do not seem to meet with favorable response. If plain plastics would do, they might compete successfully with metal strips which must be wood grained. When it comes to graining plastics, they become too expensive for the purpose. It is known that General Motors was planning to use more plain paint and less graining in

this year's models. At the last moment this policy was changed, obviously as a result of consumer research. Plain colors appeared, however, in some of the more expensive models, especially black, and plastics would have been superior to contemporary materials for the purpose since they never chip and the color remains intact throughout the life of the car.

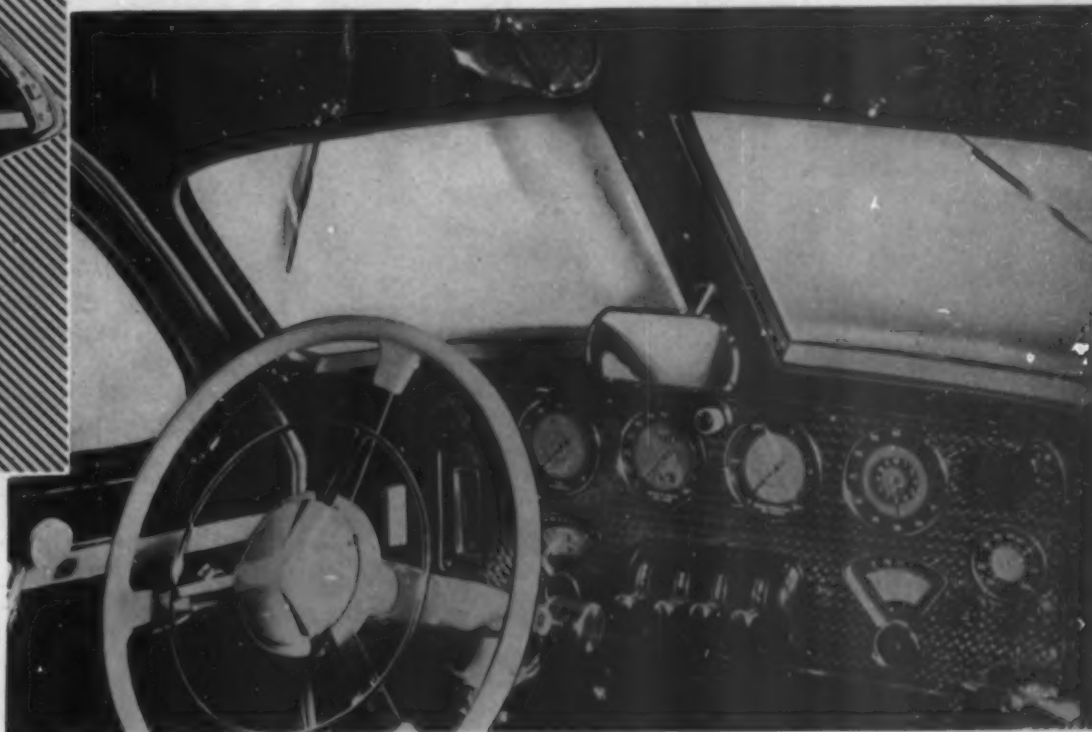
Hudson, in 1932, tried plain paint on the standard model Terraplane. At the end of the season it was found that the demand was almost entirely for the de luxe model, which was wood grained inside. The theory that graining influenced its greater sale may be a mistaken one inasmuch as so many other innovations appeared in the de luxe model. Some paint is being shown again this year but most models are grained since nothing has taken the place of graining in public acceptance. Mr. Spring believes that inlaid plastics—silver stripes in black or colored bands for interiors—may go far toward changing this attitude. If these can be introduced gradually, the public may eventually be weaned away from wood grainings in automobiles as it has been in interior decoration for the home and in public buildings.

Another suggestion for the use of plastics is in the back of the front seat. It would be entirely feasible to have here a large section of plastic combined with upholstery cloth held in place much as cloth is held in place in an embroidery hoop.

Metal is cold in interiors and manufacturers would naturally prefer to get away from it as far as they can within reasonable competitive costs. It seems logical to assume that window regulating handles, since their knobs and escutcheons are of plastic, could be extruded with a metal core. Although Hudson's ex-



Steering wheel and control knobs on the aeroplane instrument panel of the new Cord are of molded plastics as are the panel strips on front and rear doors shown at the left. Note the extra large knobs on window controls



perience along these lines has been disappointing, experiments are still being carried on hopefully. In this connection it has come to light that some automobile manufacturers are covering metal with Celluloid to get unusual effects, to present the appearance of molded parts, and to steer away from coldness of touch. One of plastics' competitive materials at the moment is plated metal. There is considerable interest in the development of plating conventional castings with unusual color effects which create a feeling or appearance of warmth in interiors. How far this innovation will progress, depends upon how quickly plastics processors develop their materials and technique to surpass it.

Mr. Spring considers that the beauty of properly made plastics is that they remain bright and that is why Hudson is willing to go to the additional expense of molding steering wheels of Tenite. It looks well when it is new and it looks equally well when it is old, and there is little doubt that as soon as a satisfactory substitute for plating outside the car is developed, it will be very welcome for use on bumpers and other parts now of chromium. For example, one seldom drives a new car more than a few days before it is scratched through the surface on some of its metal parts and begins to rust. The brilliancy of plating is needed, but plating itself does not stand up. Some-



Chrysler group of interiors (reading top to bottom) showing ash tray, window control knob and escutcheon in the new Dodge; close-up of rear seat concealed ash trays in Plymouth and Chrysler, all of Tenite; and finally the instrument panel of De Soto with enameloid cloisonné faced instruments and knobs of Tenite

thing is bound to be done about it before long but whether plastics will be the solution of the problem or not remains to be learned. Whatever evolves, it must be flexible which plastics in their present state are not.

"Anything a man imagines," says Mr. Spring, "can be done in time. The problem is to develop a flexible plastic material, but as long as it is left in the hands of the plastics manufacturers to develop, its progress will probably be slow. But let an emergency arise, let the material become a necessity, and it will be solved quickly."

He says this is frequently evidenced in the automobile business when some project is given to the engineers to work out. If no time limit is set, the development drags along over a long period of time. He illustrated his point by relating an experience of the Hudson Company. One of its engineers was requested to step up the speed of the six cylinder car from 80 m.p.h. to 100 m.p.h. before show time, if possible. The result desired was to make the motor more flexible and smooth (Continued on page 60)



Costs cut, steps saved, through molding

BY DON MASSON
BAKELITE CORPORATION

THE new Leica "Umino" projector, manufactured by E. Leitz, Inc., was created specifically for amateur photographers who use the Leica camera and wish to project pictures taken with this camera. Portable and light weight, the projector employs the same film as the Leica camera, which is a 35 mm. motion picture film that takes a double frame for each picture. The projector may also be used by salesmen in their sales presentations.

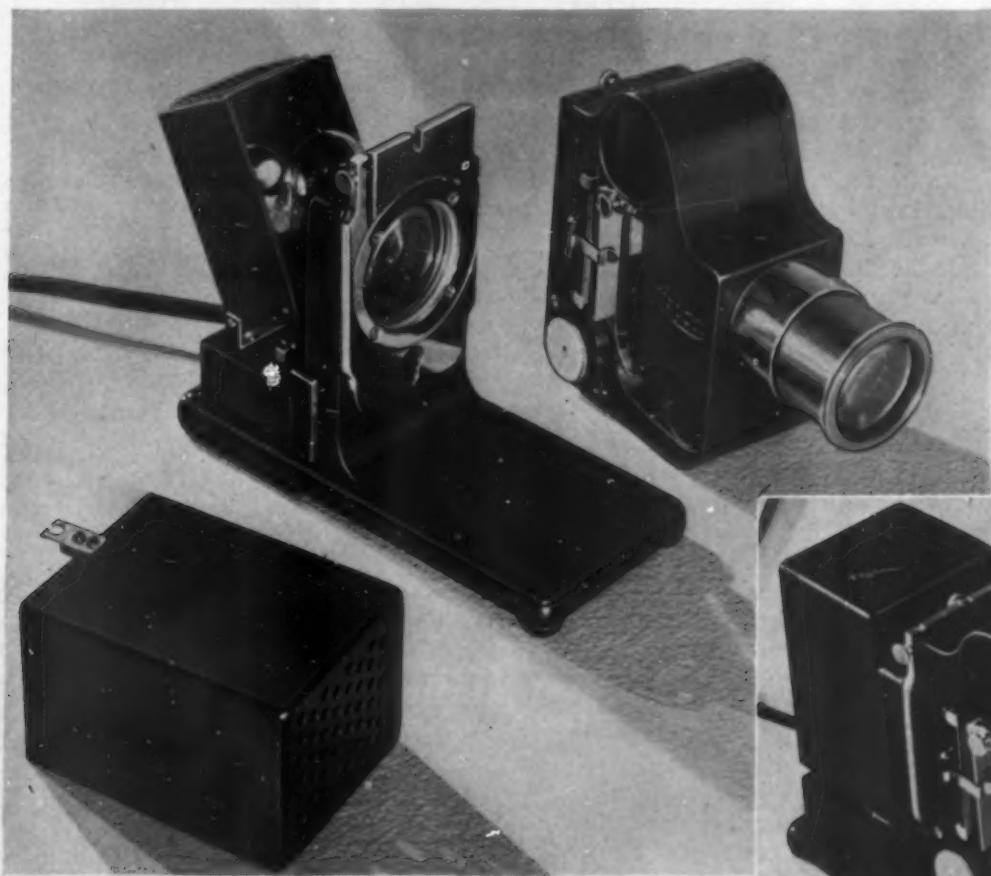
At first it appeared that it might very well be made from metal stampings or die castings, but for four very good reasons this plan was soon discarded, and molded plastics proved to be a better solution to the manufacturing, assembling and finishing problems involved. In the first place, with metal stampings there would be too many assembling operations. Secondly, the use of metal would tend to increase the weight of the projector, and one of the objectives was lightness in weight. Third, it was necessary to employ a

100 watt lamp in the projector, and metal would quickly transfer the heat generated by this lamp. Fourth, if metal were used in the projector, there was the problem of finishing.

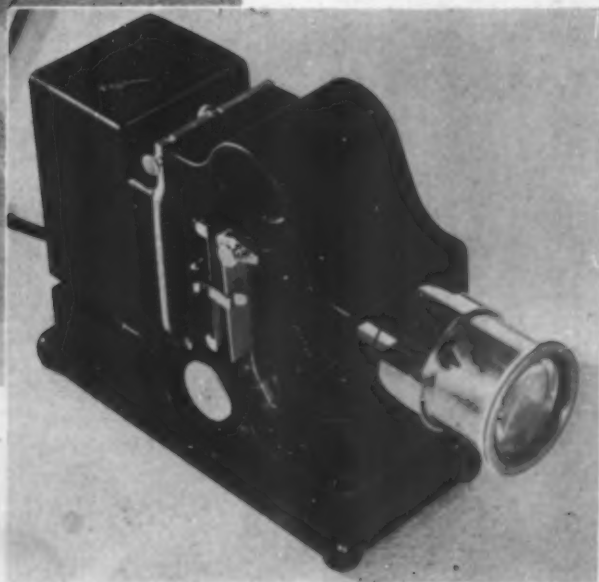
The company soon decided that the only economical method of producing the projector was with molded plastics. The unit cost was lower than with either metal stampings or die castings. When the production plans were completed, it was found that the entire unit could be made in three sections in one operation. These sections included the base, film housing and lamp housing. Trimming, punching, drilling, grooving, and finishing were eliminated at a single step. All these operations would be necessary if a machined material were employed.

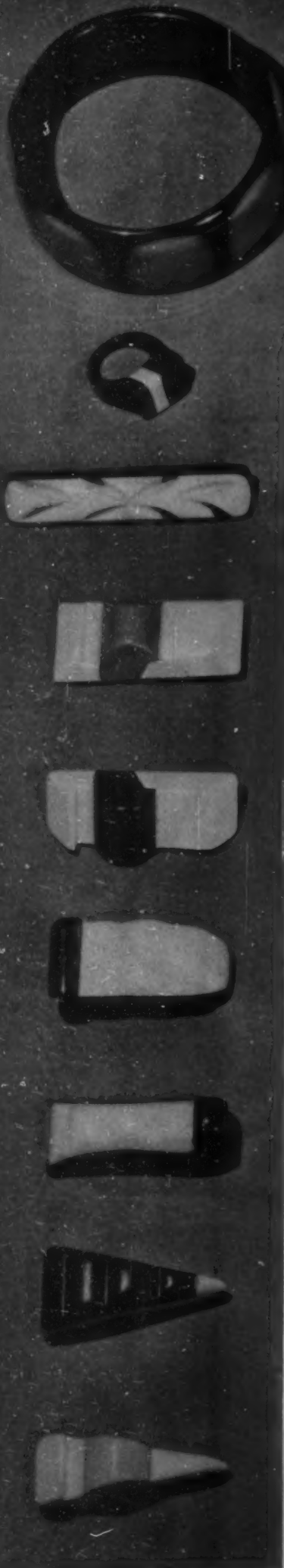
When the sections come from the molding press they have a permanent, lustrous surface that requires no finish. The color is lasting and cannot peel off, inasmuch as it is an integral part of the material.

Grooves and holes are made at one time in the molding operation. Metal inserts are placed accurately and firmly in the same operation that forms the parts. The molded unit has a better appearance, because there are no rivets or other projections on the outside. There is also uniform precision in using molded plastic which provides accurate fitting of each part. Where a
(Continued on page 51)



The versatile qualities of molded phenolics provided the manufacturer of this projector with a special high-heat material for the lighting compartment and a material of uncommon impact strength for its base





As a woman sees design

AN INTERVIEW WITH BELLE KOGAN

BY MARCY BABBITT

"IN PLASTICS the manufacturer has a material with tremendous possibilities," says Miss Kogan. "It is still in the active process of growth and development, but is rapidly gaining its stride. It is a material which no manufacturer, if he be alert and watchful of his competition, can afford to overlook. Radios, clocks, dishes, jewelry—all being developed in plastics today—have an enormous significance.

"Laboratory staffs and engineers are working toward a greater perfection of materials and compositions; for a finer classification of types of plastics; for a more practical and workable substance for molding and shaping larger sizes. It is inevitable that in the near future the world of manufacture will engage in a huge business of plastics—a business unconceived ten or even five years ago.

"But the thing which needs most to be understood by the manufacturer—particularly at this stage of our commercial development—is that the sale of any product is greatly determined by the reaction of the feminine consumer."

In considering the marketing and merchandising of any commodity, the modern manufacturer is confronted with the problem of pleasing the American housewife. Thirty million women—all potential customers—constituting practically the entire buying structure of the nation—comprise a force which cannot or should not be disregarded. The tastes of the American woman, her reaction to color and form, are of vital importance to the manufacturer.

And to those manufacturers who are using or who are planning to use plastics in the production of com-



BELLE KOGAN

Born in Russia, Miss Kogan came to America with her parents when she was four years old. Upon graduating from high school, at Bethlehem, Pa. she was awarded a state scholarship to the Pennsylvania Academy of Fine and Applied Arts. Later her ambition was to become a portrait painter, so she studied at Pratt Institute, with Boardman Robinson, at the Art Students' League and with Winold Reiss. While attending classes Miss Kogan was associated with her father in the jewelry and silverware business where she developed an understanding of the kind of merchandise consumers were buying.

Her criticism of the design of these wares, and her ability to draw, lead to a position as designer with the Quaker Silver Co. at Attleboro, Mass. While working there, Miss Kogan took her first course in design at the Rhode Island School of Design. Not satisfied with the limited acceptance of new ideas at the school, she went to Germany and studied at the Kunstgewerbe Schule in Pforzheim during 1930 and 1931. On her return, she again took up her work as designer for the Quaker Silver Co. Fearing the consequences of designing only one type of product she resigned and established herself in New York with considerable success as a free lance designer.

← Smart two-color cast resinous jewelry designed by Belle Kogan for Blefeld & Goodfriend. ↓



modities, the feminine viewpoint is one to be studied closely, to be understood, to be coddled. Objects are being produced now in plastics which demand improved design before they can enjoy a wider consumer acceptance. Other things cry out for creation, which have not yet been conceived by any manufacturer.

No matter what the object is—whether an article already in manufacture or one soon to be produced—it must be styled for its appeal to women if the manufacturer wants a sales success. Articles manufactured in mass production for a popular priced market demand a knowledge of feminine buying psychology.

Today there is probably no one group more keenly alive to the caprices and demands of the buying public as industrial designers. The designer's viewpoint, therefore, is a valuable one from the basis of manufacture as well as from the basis of merchandising and selling. It is a broad conception of consumer's desire.

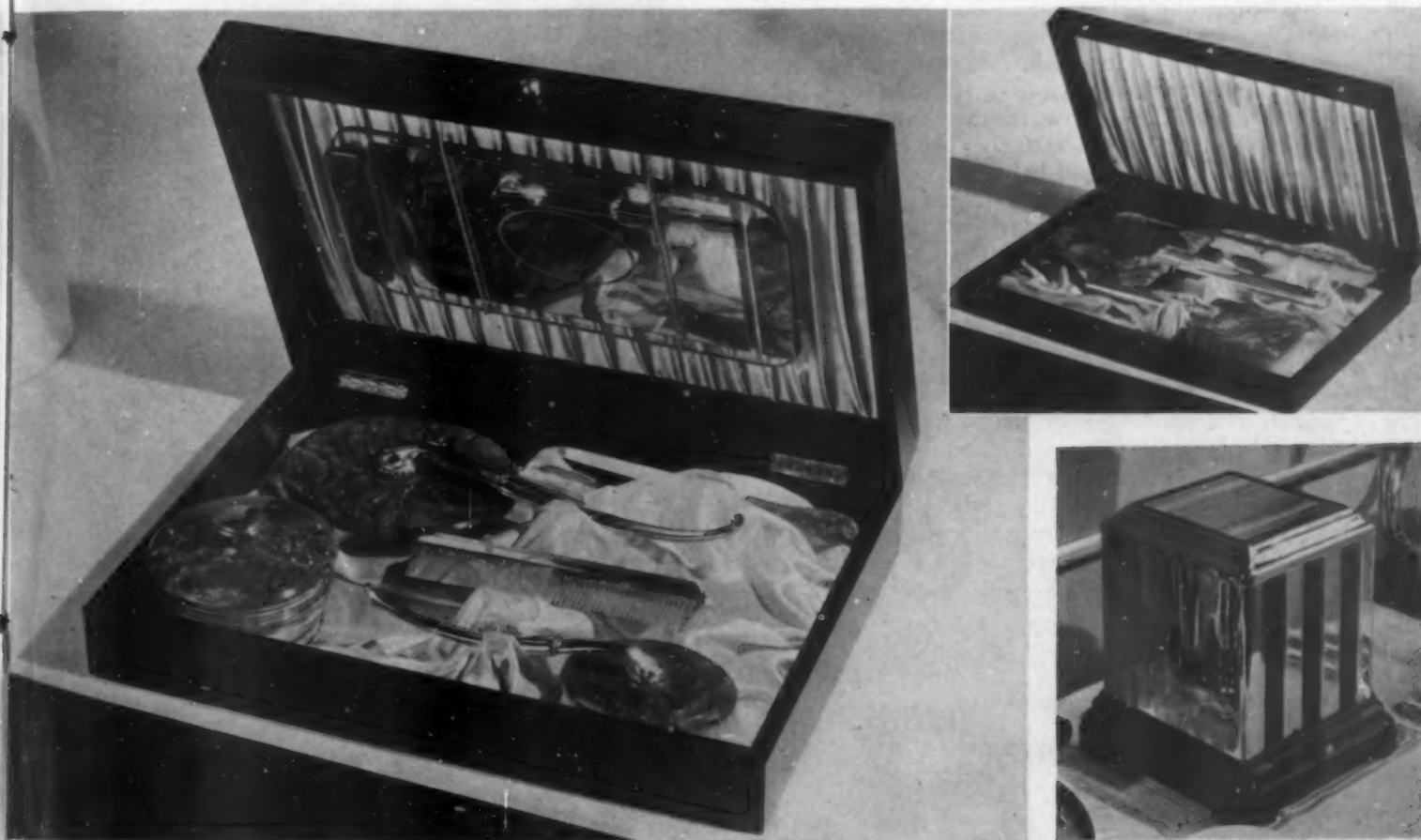
"The women of today," says Miss Kogan, "those who belong to the middle classes (and these are the women who comprise the greatest group of consumers) want attractive things, things which are smart and things which are new. They are still interested in keeping up with the "Joneses." Items, to be readily acceptable cannot, however, be too extreme in design. Such items do not fit into the average home, decorated as it is, with objects which are not too modern or severe in color or form.

"In designing for mass production, the designer must be aware of two things. First, he or she must know who the ultimate consumer is likely to be. Secondly, in designing for a popular priced market, there must be a realization of the limit to what can be done with color and form, and the designer must confine his designs within these limitations. Designs must be practical, not only for satisfactory manufacture, but practical from the standpoint of their utilitarian appeal to the public."

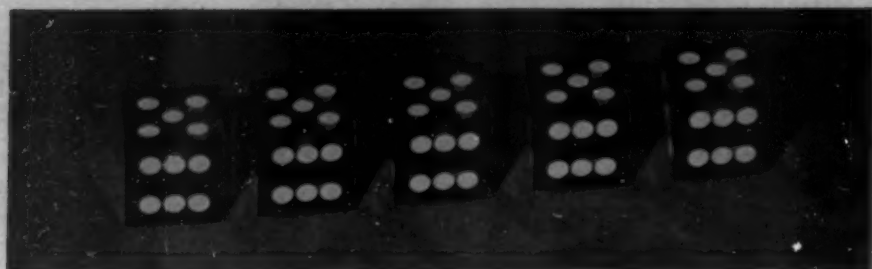
In questioning Miss Kogan as to her definition of the word "practical," she said: "Any device which will help a manufacturer to sell more goods can be defined as 'practical'."

Miss Kogan was one of the first industrial designers in America to experiment with plastics, and her experience began in the laboratory of the Karolith Corporation, a company which manufactured casein plastic rods and sheets. Barely out of her teens, she was given the position of color consultant with this company. She worked with the chemists and helped them develop jewel tones of rose quartz, lapis and amber, becoming intensely interested in this synthetic material which she has since used extensively.

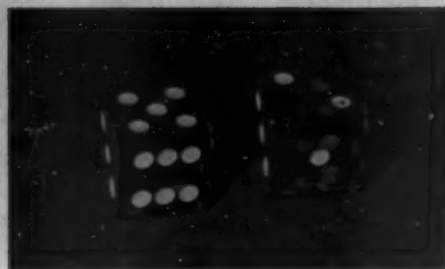
She has designed clocks and novelties for the Fox Novelty Co., plastic jewelry for Blefeld & Goodfriend, which sold throughout the Woolworth stores; and plastic salt and pepper (Continued on page 49)



"Continental"—a toilet set of Amerith with gracefully curving handles of metal, appears directly above. At the upper right, is Miss Kogan's "Capri" toilet set—Both were designed for Celluloid Corp. At the lower right is the three slice toaster of chromium with plastic base designed for Sampson United Corp.



Set of five matched dice with spots ground flush with their surface and calipered for accuracy to two ten-thousandths of an inch



A pair of precision dice which will not vary two ten-thousandths of an inch in any dimension. Spots are slightly concaved

When the wheel turns

GAMBLING is not only a profession, it is big business which has progressed and kept well apace with the times throughout the world. All through the ages, it has been the sport of Kings, and no man is too humble to enjoy the exciting thrill of expectancy which comes with the turn of a gaming wheel or the throw of dice on which his bet is laid. Nor is gambling in its general sense confined to any one class of our civilization or to any solitary community. Scorned by the righteous and frowned upon by reformers, it goes merrily on to the amusement of millions whether or not they win.

Sweepstakes, policy, pin games, and alley "crap", whose yearly volume of "take" runs into inestimable sums, are merely side performances. They are no part of the main show. The real business of gambling—professional gambling—is more intimate and formal. It is conducted along well established and dignified lines, usually within the law through concessions, wherever sufficient numbers of our wealthy population congregate with time on their hands and money to spend. Casinos representing thousands of dollars each in investments are established at strategic spots in this country and abroad and during times of free and easy money flourish with seething prosperity. Clubs with extensive memberships enjoy equal popularity and their gaming equipment frequently represents a greater investment than the remainder of the club with all its furnishings and is chosen with infinitely more care.

What has all this to do with plastics?

Simply this! Two of the most important implements of gambling—dice and checks—have been made of plastic materials for a number of years. Unless you are a professional gambler, you may be as surprised as we were to learn how much engineering skill and precision workmanship go into their manufacture.

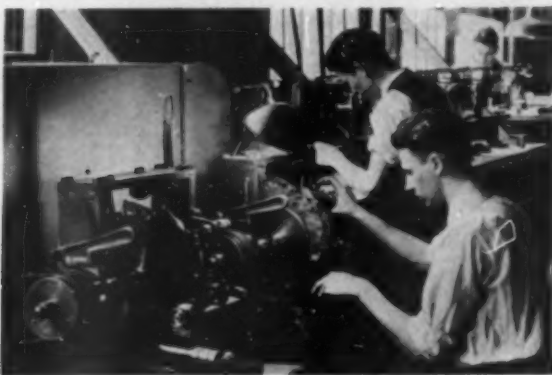
An estimated eighty per cent of all professional gambling equipment sold in this country is made by Mason & Co. whose main office and plant is at Newark, N. J. Its other plants are in operation at Kansas City, Detroit, Chicago, New Orleans, Los Angeles and San Francisco. Within this organization, which has grown up since the war, precision manufacture of gambling equipment in mass production has been established and developed. Complete furnishings for clubs and casinos are turned out in these plants. Everything from a sheepskin lined dice box to a complete layout including lighting fixtures and club chairs can be supplied. Prices begin at about a dollar for a good pair of precision dice, varying through checks, club markers, casino cage tables, chuck luck cages, black jack, hazard and faro tables and equipment, klondike, stud, poker and chemin de fer tables, pari mutuel, jumbo dice and chuck luck wheels, keno, la boule and miniature games, up to a convertible library and roulette table, from which the wheel and layout may be folded and removed quickly, at about thirteen hundred dollars. Not to mention smaller items such as security boxes and money bags of genuine leather which are incidental but important to the profession.

Inlaid square edge club checks showing the variety of stock designs in red, white, blue, yellow, pink, green, chocolate and gray. Indestructible with sand-blast finish





Machine for testing dice for accuracy. Each cube must come within the prescribed tolerance of two ten-thousandths of an inch or out it goes



Section of Mason Co. dice making department showing a diamond point cutting machine at work squaring the dice. The second workman is drilling holes for spots

Regulation roulette wheel and bowl with layout, convertible into a library table at a minute's notice. The elaborate carving and French polish on these wheels take months to produce



Group of checks from the Mason Co. collection gathered from all parts of the country, many from famous establishments which you may recognize



The business began quite accidentally and in a very small way shortly after the war. Mr. Embree Drake, its founder and president, happened to visit Monte Carlo during the war, and rather amazed at the elaborate furnishings and equipment necessary for the various games of chance, wondered where it was manufactured. When he returned to America he began to investigate and learned that cards were manufactured by one company, dice by another, and roulette wheels by still another. He conceived the idea that all these objects could be produced more economically by one manufacturer. With this ultimate goal in mind, he started to make dice in a small shop in Kansas City. From this beginning the business has grown to undreamed of proportions. Credit for its growth, strangely enough for gambling devices, is based upon the honesty and integrity of its associations with its clientele, and upon the painstaking care and thought applied to each item manufactured.

Dice, in the Mason plant, are machined with specially designed precision tools that hold tolerances strictly within two ten-thousandths of an inch in order to maintain an almost absolutely accurate balance. These, of course, are not the ordinary molded garden variety of drug store dice nor the kind found on sale in five-and-ten-cent stores. They are precision dice used in professional gambling by a most exacting clientele. This does not constitute their only outlet, however, because there are many amateurs and semi-professionals with an appreciation of fine workmanship who want reasonably good dice and are willing to pay a fair price for them. Sporting goods and department stores, recognizing this demand, are prepared to meet it.

The dice are made of a special formula of celluloid called dice sheeting. These (Continued on page 54)

Characteristic highlights on polystyrol

CONSIDERABLE success appears to have been achieved with polystyrol moldings, especially in Europe, as the pieces illustrated on the opposite page will indicate. Water-clear intricate parts are accomplished by injection molding and find their greatest use in electrical applications where dielectric properties of the material are outstanding. This type of material is also used widely for fountain pen parts which are likely to come in contact with ink, and in inkwells, and ink bottles, because it is inert and resistant to most of the chemicals generally used in compounding inks.

That it has found rather general use in cosmetic packaging is also indicated by photographs in the upper half of the opposite illustration. All these pieces, we are informed, are manufactured of polystyrol on injection molding machines made by Eckert & Ziegler in Germany. The pieces themselves are individually identified in the adjoining column and their appearance here is as much a matter of the interest they arouse in injection methods of molding as it is of the material used in their manufacture.

Polystyrol as it is made abroad is water white and perfectly transparent. It extrudes from the machine in which it is made in the form of ribbon which looks exactly like fine glass. This ribboned mass forms together like huge lumps of glass and is crushed into a coarse granulated powder for molding. In its clear and transparent form, however, it has met with little molding success in this country. Pieces, after they have been molded a while, grow milky and cracks develop throughout the surface which no one has yet been able to explain. Whether or not this difficulty is experienced abroad we have never learned.

Polystyrol, when pigmented with color, is reported to be a satisfactory molding compound even in this country, and because it is comparatively inert and tough, finds many suitable applications in spite of its high price. Its water absorption is zero. The majority of the material being imported into this country, however, is diverted to the manufacture of clear metal lacquers and as base for high grade white or light tint enamels. A complete chart of the properties of polystyrol will be mailed without charge to any of our readers who are interested in having one.

It is interesting to note the intricate moldings made possible by injection methods. Flanges and separators may be made paper thin and delicate inserts may be definitely located within the smallest fraction of an inch without danger of crushing. Many of these examples in the glass-clear group of technical parts are complicated in design and would be impossible to accomplish by orthodox methods of pressure molding. The separator (number 23 in the illustration) is probably used in the manufacture of storage batteries since it is reported to be insulated and acid-proof.

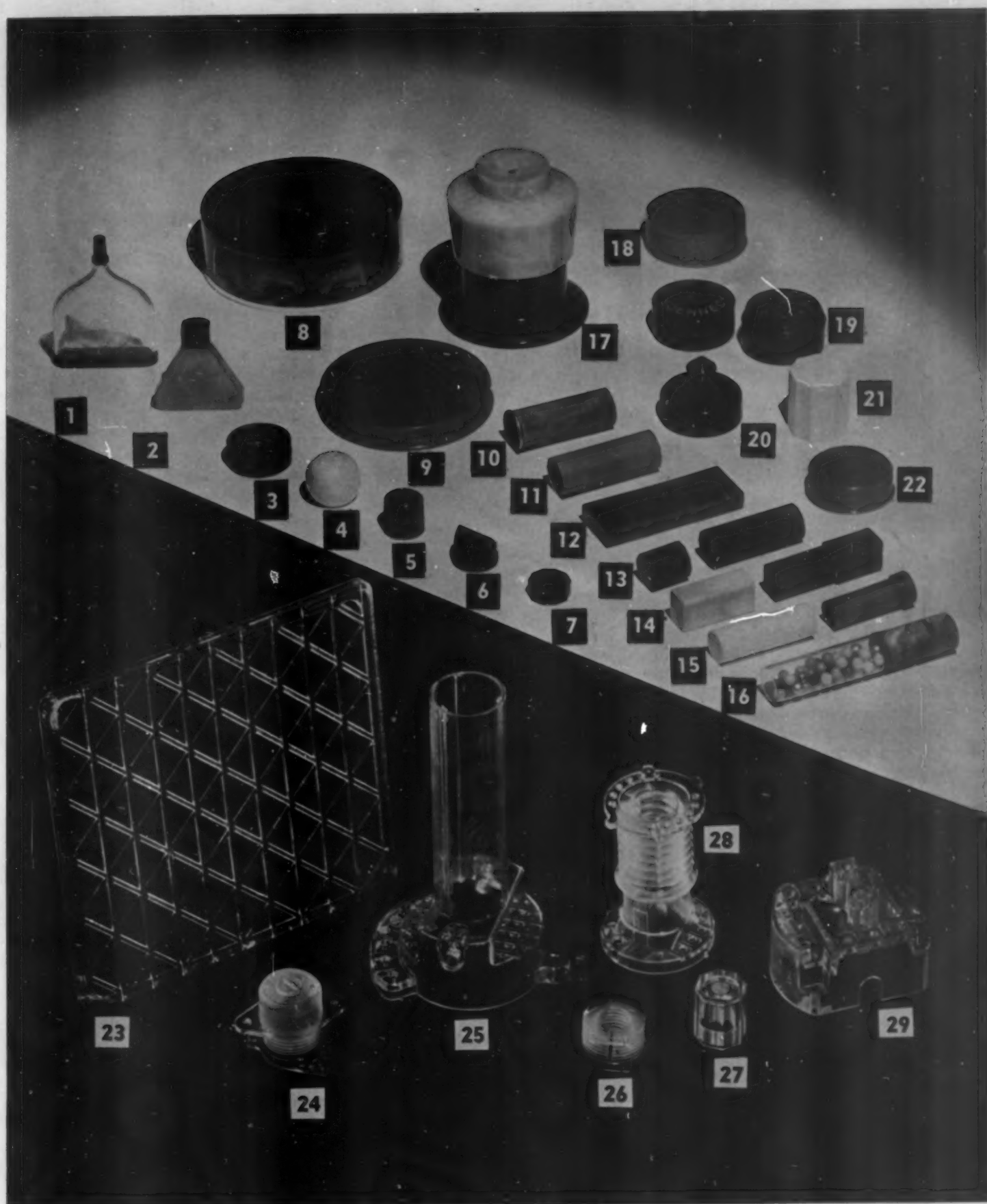
In the cosmetic packaging group it is interesting to note that several lipstick holders are molded com-

pletely, tube and cover, yet the walls are almost as thin as though made of metal. Another piece of uncommon interest is the eye-dropper bottle (number 1 in the illustration). The bottom is a separate part, cemented on, and the sides are sufficiently elastic to cause drops to be released from the dropper through a slight pressure on the sides of the container eliminating the necessity of a separate dropper.

These injection moldings will remain on exhibit in the corridor cases of our show rooms for the next thirty days where anyone who cares to do so may examine them at their convenience.

These captions came to us, not in our mother tongue, and while our translation may not be impeccable, we assure you we have done our best. Numbers refer to opposite page.

1. Eye drop container with bottom cemented on. Lettering and drop opening are accomplished by injection molding and there is a tiny closure which fits tightly. Drops are released by a slight pressure on sides of container eliminating the use of separate dropper 2. Tablet container of pale blue styrol with metal cap of dark blue. Lettering appears on side near bottom 3, 4, 5, 6, 7. Screw caps for tubes or bottles, some with engraved tops wiped in with gold 8. Large powder box with telescope cover. Box is ivory, cover is thin tortoise 9. Jar cover with four clasps which make a tight closure with a one-quarter turn. This is quite similar to conventional jar covers made of metal in this country and is equally thin 10, 11, 12, 13, 14, 15. Lipstick holders, round, flat, ten-sided, and square. Number 10 has an injected ring of metal at mouth. Both holders and covers are injection molded with walls as thin as those commonly made of metal 16. Pill bottle of glass with styrol telescope closure designed as a whistle 17. Cream jar in three parts. When one turns the center part down, a ribbon of cream is released through a hole in its center. Base and cap are black with yellow mottled center 18. Small telescope powder box with injected design in cover suitable for metal inlay or contrasting color which may be wiped in 19. Box and cover for Soennecken Pens. Nine holes are molded in to allow pens to stand on end with their points visible 20. This is the cap or cover for the cream jar, Number 17 21. Another screw closure of ivory white with nine fluted sides. Much heavier construction than other closures 22. Small jar or bottle cover similar to Number 9 except that it has a continuous thread instead of four clasps for closing. **The following technical parts are water clear injection moldings.** 23. Double lattice separator of Trolitul (polystyrol), insulated and acid-proof 24. Spool with cover; the joint on the spool and the cover is injected from the front 25. Large spool body with holes molded in 26. Small throttle spool with paper thin flanges 27. Water clear closure with eight flat sides giving almost the appearance of cut crystal 28. Medium size spool body with thin flanges and injected holes 29. Injection molded electrical socket of extremely complicated design with twenty-two holes of varying sizes molded in, evidently to accommodate electrical wiring



Injection moldings of styrol from Germany



The new Kem Playing Cards of Lumarith are packaged in a box molded by Watertown Mfg. Co. of Neillite

Indestructible playing cards take honors

BY A. J. ST. JOHN
CELLULOID CORPORATION

THE versatility of thermoplastic materials was never better demonstrated than by their invasion into the playing card field. More than eight long centuries have passed since playing cards made their initial appearance in a Chinese court, before the nearest approach to a perfect playing card material has been discovered.

The evolution of shape, size and design of present day playing cards since their origination is always interesting. Playing cards in common with chess, dice, backgammon and other games have an Asiatic origin. Although their place of origin has always been in dispute, it does not really matter whether they first made their appearance in China or India. The fact remains, that the first playing cards were hand painted on paper and were richly decorated and beautiful to look at, nevertheless they must have been very crude indeed to play with. When they were introduced into Europe they were taken up by the nobility and the royal courts immediately. In the household book of the treasurer of Charles VI of France, there is a reference to a commission given a painter to execute a pack of cards. This was in 1392. It is fair then to assume that playing cards were pretty well known for some time prior to 1392. Today some of the early examples can be seen in museums. They were round in form.

Playing cards have been generally associated with gaming. Of course, even today they are used most generally for playing all sorts of games, but they have also been used in the past for the teaching of grammar, geography and heraldry. The politicians of the Elizabethan period had sets of historical as well as satirical cards. Today there are sets available for children's nurseries with illustrations of some of the more popular nursery rhymes as well as cards for telling fortunes. John Lyly, 1553-1601, wrote a little couplet which runs:

"Cupid and my Campaspe play'd
At cards for kisses; Cupid paid."

It is apparent from the above verse that even affairs of the heart sought their solution in a game of cards. The Elizabethan court and the nobility of the time were unquestionably enthusiastic card players as evidenced today by the influence of the costumes worn even in Henry VIII's time in the designs used in kings, queens, jacks and jokers of present day decks.

As the art of manufacturing playing cards advanced from the primitive hand painted ones to printed ones, they became increasingly popular due to the reduced cost of manufacturing so that now they are well within the means of practically every individual.

Advancements made in the art of printing and in making papers have helped considerably in producing cards of better playing quality and durability. Indeed, there is a vast difference, not only in improvements made in printing but in the quality of papers as well since the early playing cards printed from wooden blocks. The goal of perfect playing cards, however, required the eventual discovery of the perfect material.

It is a well known fact that the best paper cards lose their resiliency after several shuffles. This is primarily due to the fact that paper absorbs moisture not only from the air but from perspiring hands of players. Since the same deck of cards is used over and over again, it becomes more absorbent and soggy looking until the cards lose their snap, becoming sticky and difficult to shuffle. Furthermore, the edges of paper cards become dog-eared, curled up and unfit for further use. Another important point to consider with paper cards is the fact that as they become increasingly absorbent they are easily soiled and germs find them a fine harboring and breeding place. Here, unquestionably, was a definite field for a material possessing qualities to overcome those so objectionable in paper cards. The demand for such material was answered by the plastics industry.

Special formulae of pyroxylin (Cont. on page 52)

General Electric develops color facilities

REALIZING the growing importance of plastics and the use of color in the design of new products and in the redesign of old products, the G. E. Plastics Department has announced its new facilities for the exclusive manufacture of color moldings. It has set aside a large part of its molding plant in Meridan, Conn., for these operations. The company has decided that in order to increase and maintain steady production on color molding and to assure its customers of spotless molded parts, it was necessary to separate the color molding from its other molding activities where dark materials of the phenolic type are handled. The rooms are white-washed from top to bottom and the floors painted so as to guard against dirt and other foreign matter. A single speck of dirt will immediately render a molded piece useless, particularly when materials such as Plaskon,



Packaged in the Christmas manner



Beetle and Tenite are being molded in the delicate pastel shades so popular with designers at the moment.

The equipment in these new color rooms is arranged so as to give the most economical production and to eliminate unnecessary motion and loss of time. Presses are of the most modern type and are individually shielded from adjacent presses. The accompanying photographs illustrate some of the work which is typical of the kind being done with these new facilities. These parts are Christmas tree fixtures, molded in red, green, blue, yellow, and white for the Noma Electric Company, and Clemco, Inc., which are two of the largest electrical device manufacturers in the country. This Christmas will find these molded tree fixtures in practically all of the leading stores that handle Christmas tree lighting equipment and decorations.

The molding material used is Plaskon which, when molded in thin sections, permits the easy transmission of light. Because of this characteristic, it is an ideal material for applications such as tree decorations. These fixtures are attached to the tree lights—the small stars being attached by a wire clip in front of the light bulb; the dome-shaped parts surround the lights and are held in place by the bulbs; the large stars and the two sizes of crosses are made in two parts, clipped together and a shaft of light inserted within. When lighted they do not glare but give off a soft warm light, bright enough, however, to reflect on the ornaments and tinsel.

With more thought and time being given to the development of color molding technique, manufacturers can look to plastics, more than ever before, for color to help dress up their products and give them greater sales appeal.

Editorial comment

WITH the closing of this old year, and with our approach to another brand new year of opportunity, there comes a strong inclination toward reminiscence. We like to take a sort of mental inventory of the heritage this year has left us and dream hopefully and expectantly about things to come. Dreaming, we are well aware, accomplishes little without courage and persistence of purpose to develop these mental rhapsodies into controlled action that makes them real. Yet, the history of almost any great business will reveal that its very foundation was laid upon an idea which in its beginning was little more than a feathery dream of its founder.

- Reminiscence, on the other hand, is more real. It is more definite. Milestones of progress along the way indicate the path we have traveled. Monuments of failure and success are clearly evident and if we are to profit tomorrow by our experiences of yesterday and today, we must recognize the opportunities we have muffed and make up our minds to not let them get away from us when they come our way again. There are those who mistake the knee-action of our modern world for a permanent limp. They do not admit that times have improved since a year ago. But conditions in commerce and industry are infinitely better. Confidence and courage within the last twelve months have returned to a remarkable degree and there is substantiating evidence on every hand.

- Country wide building activity is being speeded by the Housing Administration with a resulting market of astounding proportions. This market embraces an opportunity for a correspondingly great variety of materials and equipment. Automobile production, which took an astonishing upswing this year, is scheduled for even greater growth and expansion in 1936. It has been a long time since automobile manufacturers viewed the future with the enthusiasm they express today.

- The American Federation of Labor issues more optimistic statements than it has in a long time. It sees increasing business confidence which may reach boom proportions if employment trends continue as they are. Stocks and bonds have reflected this renewed confidence in no uncertain way. These views of capital and labor are emphasized by a statement accredited to the ordinarily cautious Federal Reserve bulletin which concluded that the United States was undergoing the most substantial economic advance since the depression began and that every sign pointed

to continuance of the forward movement. It would, therefore, appear that the heritage left by this year 1935 is one of definite progress.

- Brief reminiscence within the field of plastics, recalling the forward steps made during the war, is enlightening. We have seen the unmistakable hand of the industrial designer effectively applied to practically all branches of consumer merchandise. His knowledge and specification of plastics for appropriate decorative and functional purposes have given all kinds of plastics more intimate contact with everyday things in the home. These contacts have helped essentially to bring the obvious advantages of these modern materials to the attention of consumers.

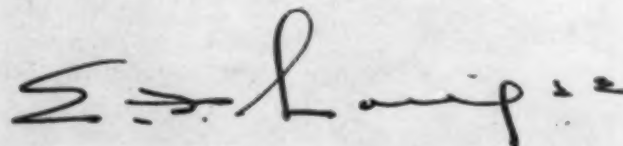
- This year has recorded the creation of the largest industrial moldings ever attempted in this country. Gigantic presses have been built. There are already several of them in production and more under construction. The automobile industry has taken plastics seriously. One plant is being built at a cost of nearly five million dollars, while other companies are experimenting with brand new applications of plastic parts in automobile manufacture.

- In the field of building construction, plastics have taken their place with other fundamental materials. Their fire resisting qualities have established them as necessities for building finish and furniture in public rooms. This same quality, and their lighter weight have brought these materials, especially in their laminated forms, into prominence in ship building both in this country and abroad. There is practically no limit to the examples that might be recalled.

- Newspapers and magazines have picked up the thread of these interesting developments and for the first time have devoted considerable space to bringing them prominently to the attention of their readers. Both financial and merchandising angles have been rather well covered.

- Materials and technique have improved with experience and industry has come to recognize the potential worth of plastics to such an extent that many things formerly made of other materials have been desirably remade through adapting these more modern materials to their design. Theories are being translated gradually into facts. Industrial engineers are becoming convinced. The dream of plastics as basic materials has really come true.

- When we consider that the plastics industry has attained its greatest growth during the recent depression, its prospects for the future become exceedingly bright now that this country is no longer afraid.



If we were giving medals . . .
we'd pin one on . . .

Edward F. Bachner, because, as treasurer and general manager of Chicago Molded Products Corporation, he is ranked among the foremost mechanical engineers and mold designers in the plastics industry; because, in early years, he supplemented his theoretical education with an apprenticeship in his father's watch factory adding practice and skill to his theories of precision machine and tool work; because he has brought this experience and this knowledge of the treatment and handling of various steels that go into mold construction to a high degree of perfection and made it available to all industry through plastic molding; and because he has written a number of valuable articles on these subjects based upon his experience.



EDWARD F. BACHNER



MADISON M. MAKEEVER

Madison M. Makeever, president of the Makalot Corporation, because of his interesting life which began on a farm in Indiana where he grew up, later to become a broncho buster riding the range in round-ups in the west, then in rapid succession he became a professional sprinter, a poor lawyer, then a mining operator in practically every part of this country, Canada, and Mexico where he still maintains and operates his holdings; because, in addition to these activities, he has taken time out to create and develop Makalot—a unique phenolic molding compound; and finally, because of his keen sense of humor which keeps him forever young and alert to new opportunities.

A scale no bigger than a pen

BARELY two months have elapsed since we announced the new Toledo Plaskon Scale whose housing is the largest plastic molding yet made in this country. Now comes Post-a-lett, a thoroughly practical diminutive scale, molded of similar materials, yet no bigger than a fountain pen. At first glance, Post-a-lett may look like a novelty—a gadget—but those who write letters at home, on the road, or at the office after the office boy has departed for the day, and sit there looking at them wondering whether or not more than one stamp will be required to carry them to their destination, will appreciate this tiny scale which always knows the answer.

This pen size scale is designed primarily to weigh letters, packages and other articles which fall within the weighing range of one-half an ounce to one-half a pound and weigh them accurately. It prevents the possibility of sending personal mail with "postage due" as well as eliminates excess postage waste, and is as easy to carry about as it is easy to use. It fits the pocket or the purse and is available in a sufficient range of color combinations to please nearly everyone who writes letters.

Made by the Exact Weight Scale Co., pioneers and manufacturers of precision weighing equipment, its permanent accuracy is further assured by special construction of the molded barrel which prevents its spring being stretched beyond its natural elasticity. There is a removable screw cap atop its barrel where the weighing spring may be shortened or lengthened to adjust its accuracy whenever this becomes necessary. The weighing rod is black with indented numerals which have been wiped in with white for convenient reading. Its lower end is fitted with a strong spring-steel clip which automatically grips a thick or thin letter, or the string of a small parcel for weighing and determining the postage required.

The barrels and caps are being molded in a variety of plastic materials in order to present color combinations of wide range and interesting surface effects of permanent finish. The smooth clean casing will never chip nor change color and the lighter shades may be easily cleaned if they become soiled. Because molded plastics are really molded color and pleasant to the touch as well, they are responsible for the attractive appearance of Post-a-lett and are credited in no small measure with its immediate sales success.

This little scale has met with instant acceptance in



A neat item premium enthusiasts will like to give "a-weigh". It takes no more space than a pencil and is quite as useful

the gift and premium fields and is now finding its way among the popular priced items for Christmas. It is one of those rare items which finds favor with a broad range of individuals whatever their occupation or station in life may be. Housewives, business and professional men and women, salesmen and students find many occasions to use a small scale so compact. Manufacturers who are stressing comfort through lightness of weight of their products can find no more convincing argument than to demonstrate these exact weights before the very eyes of their customers. Salesmen, selling such merchandise, find these little scales welcome premiums to offer retailers to pass on to their salesmen for similar demonstrations.

Advertising managers are constantly called upon to determine the weight of mailing pieces in advance of their preparation. Dummies and layouts can be instantly classified as to their mailing costs by slipping them into a Post-a-lett. Through its use, advertising managers will no doubt recognize it as a practical media of remembrance advertising with wide popular appeal. The molding is being done by Recto Molded Products, Inc. Plaskon, Beetleware and Tenite are among the materials used to mold this little scale.



Mickey Mouse gives Santa a hand

SANTA CLAUS will hardly recognize the old Christmas tree this year with these new lights by Noma Electric Corp. Mickey and Minnie Mouse, Donald Duck, Pluto the Dog and other Walt Disney characters form the decorative motif in this latest innovation for Christmas tree lighting. Their unique introduction is made possible through the use of molded plastic bell shaped shades.

"We chose plastics," says Mr. Wolfe of the Noma Company, "because they illuminate brilliantly, add little weight to the fixture itself, and because they are uniform, fireproof, and less fragile than glass. Besides these advantages, they are cheaper than other comparable material, and because they are light in weight, shipping costs are held at a minimum.

Action scenes depict Mickey Mouse and his gang in various unusual poses that are gaily reproduced in brilliant but soft warm colors which make a good background for other decorations on the tree. The bell shaped shades are about two in. high and one and one-half in. in diameter and are held in place by the orthodox Christmas tree bulb without any special attachment being necessary.

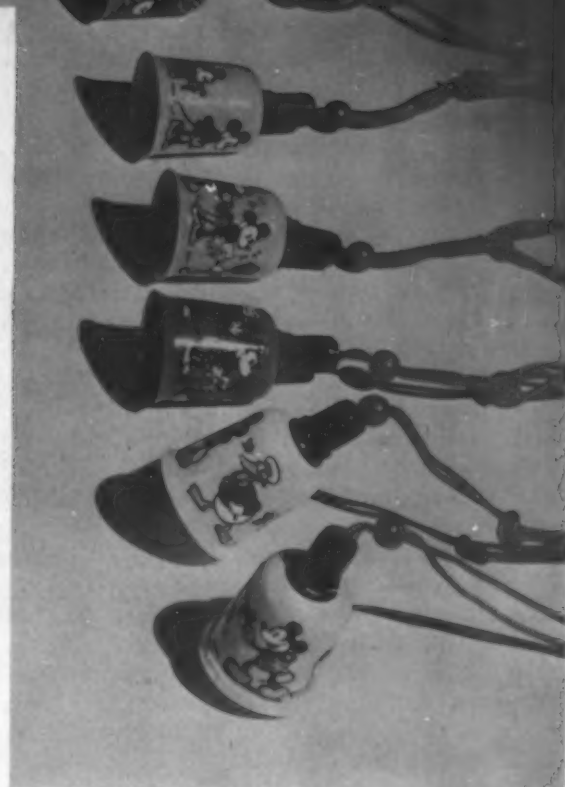
The novel introduction of shades for tree lights will be an incentive this Christmas to replace old strings of lights left over from years past and the appearance of Mickey and his companions has a universal appeal to old and young alike. The lights are easy to put on the tree and the shades being molded of urea formaldehyde, are unflammable and perfectly safe. The prancing humorous characters will add joy to countless youngsters.

Another feature of Noma lights that will be appreciated by those whose duty it is to trim the tree is the patented "berry" bead which is designed to slip along the electrical wires and hold the lighting sockets in the proper position on the branch. This not only

prevents the lights from falling off easily but holds them in an upright position to give full decorative advantage of the colorful shades.

Each set has eight different colored bells with eight different scenes packed in an amusing box, highly lithographed in color with Disney characters. They are suitable decoration for year round festivities, being by no means limited to the Christmas season. The shades are molded of Beetleware by Bryant Electric Co.

The novel introduction of these popular Disney characters into Christmas tree decoration gives promise of repeating the merchandising success these characters have enjoyed in other fields. Wherever Mickey has appeared as an auxiliary salesman, he has carried sales figures to new heights and there seems to be no limit to his versatility. In this instance, he has a popular vehicle of equal versatility. Plastics as lighting fixtures are just getting under way and these miniature bell shaped shades, for Christmas, are forerunners of very interesting developments to come in the near future.



Predictions of a chemical engineer

BY LAWRENCE E. STOUT

ASSOCIATE PROFESSOR OF CHEMICAL ENGINEERING,
WASHINGTON UNIVERSITY

THERE is an old saying that "a scientist never predicts." In industry the role of historian is much more satisfactory than the role of the prophet. However, when one remembers that few of the important items of commerce today promised little more than laboratory curiosities at the time of their discovery, one may risk a certain degree of speculation by giving his personal estimate of the future prospects of a specific group of industries.

The chemical engineer stands in a unique position in modern industry. He must have sufficient chemical training to grasp the chemical problems that arise in the large scale production of chemical products. His engineering training enables him to develop a process from a laboratory experiment through the various small scale tests and pilot plant developments until full scale production is attained. In other words, the laboratory may report a valuable set of facts but it becomes the duty of the chemical engineer to produce the products in such quantity and of such a quality demanded by the market.

However, the chemical engineer should not stop at this point. Many uses and applications of a process and product arise spontaneously. The farsighted organization employs a capable staff of engineers whose duty it is to develop new uses or outlets for each class of materials which it produces. In other words, a careful and critical development of an industry calls for the creation of new demands for the products of the manufacturer. Industry today has numerous monuments to such chemical engineering salesmanship and developments and these monuments contain no "here lies" inscriptions. These developments represent a definite contribution in meeting the legitimate needs of society today.

One might cite innumerable examples of such industrial development. However, one need look no further than the plastics industry to illustrate all the points mentioned above. This class of materials is a veritable haven for the chemical engineer. The extensive patent literature on phenolic, urea, thiourea, vinyl, styrol, pyroxylin and acetate plastics shows the variety of chemical materials which may serve as raw materials for this class of product. Moreover, the production of these raw chemicals calls for the widest variety of chemical practice. The lowly corn cob finds itself a starting material alongside some chemical compound whose name is meaningless to anyone short of a trained organic chemist.

Mechanical developments in the industry have made molded plastics products just as democratic as the raw materials from which they spring. One may purchase samples of such materials at the "dime store", he may pay high prices for artistically fashioned and colored articles for ornamental purposes or he may obtain a product of far greater value because of the use of "plastics" as a material of construction. Non-breakable cups, saucers, dishes and "glasses" vary in price

over wide ranges. Ornaments ranging from radio grills to dress clips proclaim the use of plastics in the second field. The modern automobile is only one of the many examples where plastics as materials of construction are superior to metals.

When one looks around at this vast array of new products he must realize that each illustrates the passing of important milestones in industry. The art of molding thermosetting resins has given way to the science of the same. Problems in heat transfer had to be tied up with heats of reaction of new chemical compounds. In some cases this demanded both heating and cooling of the molds. Preforming of molding powders, plating of molds, optimum pressures of molding, etc., became serious engineering problems to be solved. However, it seems that in this industry the difficult engineering feats have been accomplished first while the much broader field of application has received little attention until quite recently. Intricate designs and patterns have been molded with a precision that is the pride of any operating engineer. Yet, much of this work has not been done in a highly competitive market. The articles were new or were used to replace materials of inferior performance or of much higher price. When the superior quality was easily visible the art of selling necessitated production at any cost within reason.

In wood working industry

While the writer does not minimize the importance of every contribution made to date in the industry, he feels that a tremendous field lies ahead in producing a true quality product in wood working industries. The past few years have seen tremendous changes in the industrial status of these trades. Metals and plastics have made deep inroads into their time honored territory. These manufacturers are learning that styles in casements, doors, trims, etc. do change. Competitors have played up the shortcomings of wood until the consumer forgets its assets or good features and learns to consider it an inferior product. Advertisements may proclaim that the grain of a wood is a liability but the public will long appreciate the beautiful designs which nature can produce in some of our finer woods. New styles may call for garish designs and color combinations but the lover of the older school of art need not feel that all modern design is against his tastes. Wood is a venerable material of construction. Its shortcomings can be minimized and its beauties extended over wider areas if the industry will take advantage of some of the chemical and engineering developments practiced by its competitors.

For example, the plywood industry today seems fast approaching a crisis. Despite progress made in manufacturing methods and in adhesives, only a small quantity of plywood is on the market that offers superior resistance to the ravages of (Continued on page 56)

Stock molds

SHEET ONE

MANY molders throughout the country have stock molds of varying shapes and sizes which are available to manufacturers who do not require plastic parts of exclusive design.

Keen buyers, alert to the possibility of saving mold costs, will welcome this series of stock items which will appear monthly. Save this page for future reference. Watch this space for additional items for which stock molds are available. Mention sheet and item numbers when writing.

Boxes and jars illustrated here may be obtained, even in small quantities, at most reasonable prices.

1. Small round rouge box with 12-sided screw cover. Inside dimensions about $\frac{7}{8}$ in. diameter by $\frac{3}{16}$ in. depth. Rounding inside base.

2. Rouge box, round with screw cover. About 1 in. by $\frac{1}{4}$ in. inside. Rounding inside base.

3. Rouge box, $1\frac{1}{8}$ x $5\frac{1}{16}$ in. inside, 12-sided screw cover. Straight walls inside.

4. Cream jar with curved sides and screw cover. $1\frac{5}{8}$ in. at opening by about 1 in. deep. Overall height $1\frac{3}{8}$ in.

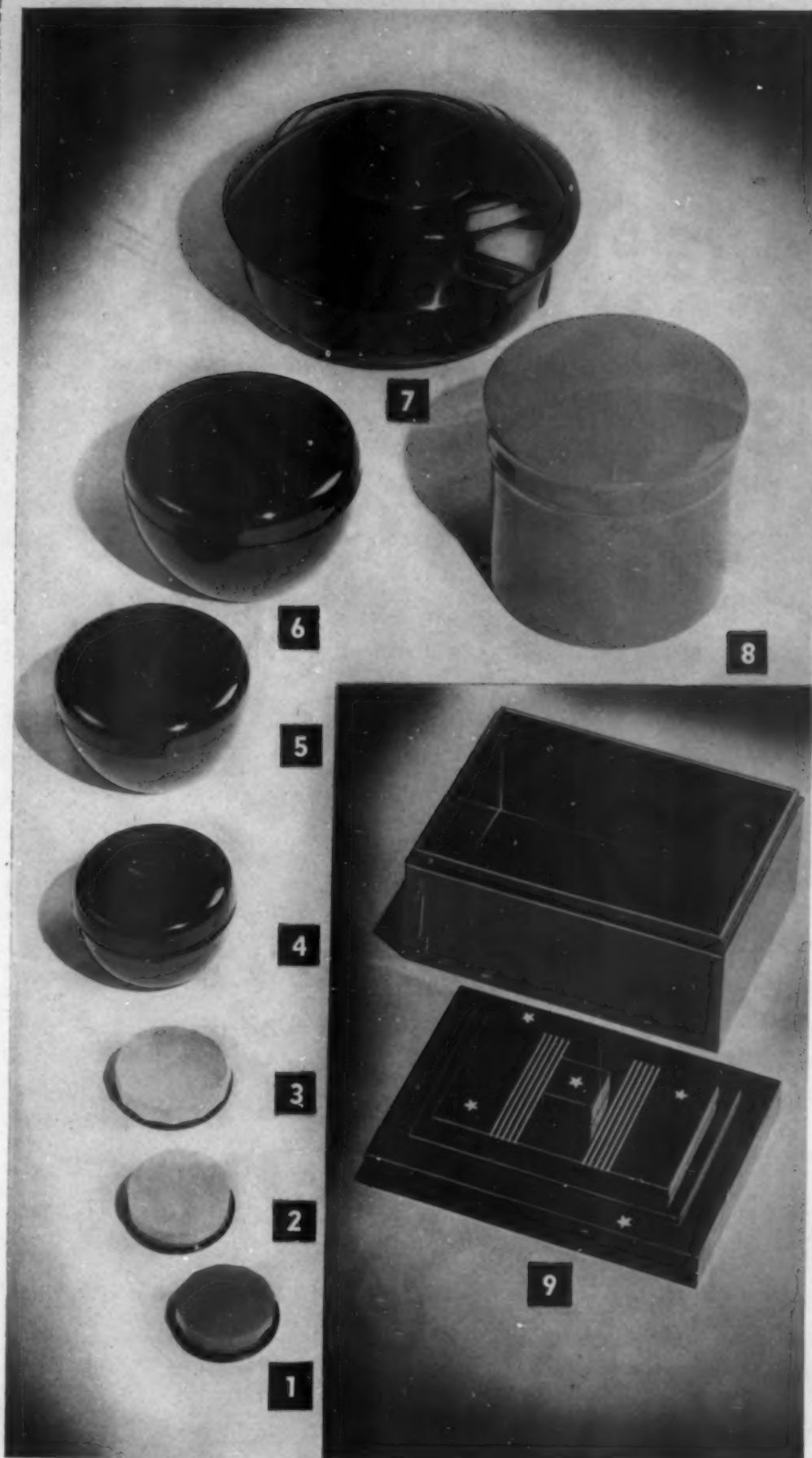
5. Larger jar, same design as numbers 4 and 6. $2\frac{1}{8}$ in. diameter at mouth by $1\frac{1}{8}$ in. deep. Overall height about $1\frac{11}{16}$ in.

6. Same as 4 and 5 except larger. $2\frac{3}{4}$ in. diameter by about $1\frac{1}{2}$ in. deep. Overall height about $2\frac{1}{4}$ in.

7. Footed powder box with designed surface and "lift off" cover with flush handle. About $4\frac{5}{8}$ in. diameter by $1\frac{1}{4}$ in. deep inside. Overall height about $2\frac{1}{4}$ in.

8. Cigarette box with rounding telescope cover, 3 in. diameter, 3 in. overall height. $3\frac{3}{8}$ in. cover diameter with slightly belled sides and top.

9. Oblong box with decorative cover. Inside dimensions of box, 4 in. by $2\frac{3}{4}$ in. by $1\frac{3}{4}$ in. deep. Overall height of box with cover is $2\frac{3}{4}$ in.



Address all inquiries to Stock Mold Department, Modern Plastics, 425 Fourth Avenue, N. Y. C. All molders are invited to send samples from stock molds to appear on this page as space permits.

WORTH FILING

Stock molds

SHEET TWO

HERE is another page of stock mold items (see other side) which indicates the diversity of handles and control knobs available to manufacturers without initial mold costs. These items can be molded of any standard molding material suitable to the item. Write for further details and prices

10. Round stove handle about 6 1/4 in. long by 2 1/4 in. high fitted with brass threaded inserts

11. Square stove handle of modern design 7 3/8 in. long by 1 3/8 in. high

12. Door knobs about 2 1/8 in. diameter with metal fittings. This sample is molded in black and ivory

13. Drawer type handle with ribbed design. 4 7/8 in. long

14. Turn handle with faceted grip and brass connecting inserts. 4 in. long. Extends 2 1/8 in.

15. Oblong control knob lettered "on" and "off". 1 7/8 in. long by 5/8 in. wide. Semi-circular opening for fitting.

16. Same as number 15 but without lettering

17. Same as number 16 with screw thread fitting

18. Control knob of modern design about 1 7/8 in. long

19. Octagonal control knob of modern design. 2 in. long. Semi-circular fitting

20. Electrical iron control knob 1 3/4 in. by 1 1/8 in.

21. Control lever with octagonal handle 2 1/2 in. overall

22. Control knob or valve lever with octagonal base and flat handle 2 in. long

23. Flat designed handle with end opening for metal fitting. 2 1/2 in. long by 1/2 in. diameter at fitting end

24. Small bolt knob 3/8 in. diameter at top by 1/4 in. at screw end

Address all inquiries to Stock Mold Department, Modern Plastics, 425 Fourth Avenue, N. Y. C. All molders are invited to send samples from stock molds to appear on this page as space permits.

WORTH FILING



Design for molding

THE combination of beauty and strength provided by molded plastics has been employed to the fullest in the type 35A5 Wall Monophone, a new telephone recently announced by American Automatic Electric Sales Company, distributor for products of Automatic Electric Company. This instrument is the newest in the long line of handset-type telephones developed by this company since its introduction, almost ten years ago, of the Monophone, one of the first handset-type telephones to meet with commercial success in the United States. All these instruments owe much of their widespread public acceptance to the skillful use of molded plastics, and these materials are now used to the greatest possible extent in all telephones made by this company. In the new telephone, the Monophone handset (including the transmitter and receiver caps) and the base and cover of the wall mounting box, are all made of phenolic molded.

This telephone was designed around the Monophone handset, for which a husky cradle, conveniently placed, and shaped for easy removal of the handset, is molded on the cover of the wall box. All other working parts of the telephone are mounted on the base, which is molded with adequate metal inserts to assure easy and quick assembly and accurate positioning of the various parts. The ensemble is altogether smart and modern.

A novel provision is found in the molding of the base.

A number of holes are required for mounting the instrument in various locations, but not all these will be used in any one case. To prevent the entrance of insects through the holes which are not used, the holes are molded with thin film closures, which may be "knocked out" as needed.

By using plastics, Automatic Electric Company was able, several years ago, to introduce color into its instruments. The appeal of color has again been provided in the new Wall Monophone. In addition to the conventional black Bakelite with black-enameled metal trim, the instrument is made in walnut, mahogany, Chinese red, old ivory, and jade green, with gold or chromium-plated trim, and the handset cord is provided in matching color.

We present this with the hope that it may prove inspirational to manufacturers of similar utility devices for modern homes. Thermostatic controls, brought into uncommon prominence through air conditioning and gas and oil furnaces, merit better treatment than many of them have received. In the vast operations of building and remodeling set in motion by the FHA and as a natural consequence of increased confidence in business generally there is a substantial market for better goods. A market that has been largely dormant these past few years.

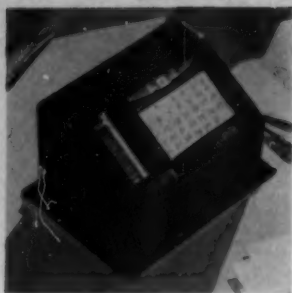
The public has tired of cheap goods. It has learned from experience that the few additional dollars asked for better merchandise is a good investment. In choosing homes and things to furnish them there is striking evidence of this changed condition. It is this mood that makes possible the sale of auxiliary telephone equipment, air conditioning, refrigeration, etc. Color, too, plays an engaging part. During times of depression there is a marked tendency toward drab dark shades. Lighter colors, even brilliant, are in demand today. Interior decoration is gay and youthful and plastics, being molded color, are so utterly suitable for casings and housings for all sorts of household devices that manufacturers who want to make a direct appeal to this market can ill afford to consider them lightly. Molded plastics are rugged, workable, lasting and appropriate materials for such applications. Their molded color may be chosen with deference to decorating trends and may be depended upon to give a lifetime of service without chipping, denting or becoming otherwise objectionable through use.

But with all their advantages plastics are often badly used. Parts are designed with too little thought given to the surroundings in which they are to be used. Color is too often chosen as color alone without due regard to the tastes and preferences of ultimate users. Color preferences may vary considerably in different price brackets as well as geographically and these preferences should be understood and repeated if satisfactory sales are to be obtained.

Design is also too important to neglect. There is ample evidence of this in recent years where, by the simple expedient of redesign, outmoded and forgotten items have forged through the crowd to become best sellers in a comparatively short time. Design is one of industry's most potent tools and wherever plastics are chosen to replace other materials, these new materials should not be given the same time-worn treatment of design accorded the things they replace.



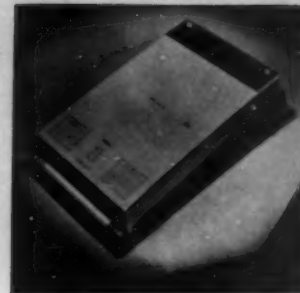
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Hardy advertising perennials

BY A. Q. MAISEL

Six years ago, New Art Specialties Co., developed a molded desk calendar, equipped with a roll-strip mechanism with months of the year for five successive years. By turning a tiny wheel at the back of the stand at the end of each month the next month's calendar moves into position.

The low cost of molding in quantities and the simplicity of the mechanism, permitted a price of less than a dollar and the calendar was well received by a number of business firms which used it for gift and premium distribution. Each year, larger orders were received and the sponsor of the product felt quite satisfied with the new addition to his line. Then in 1934, the first five-year date strips ran out. Remembering that most of the calendars were distributed without cost to the final recipient, the sponsor felt he had obtained a pretty good measure of the product's

success when refill orders mounted to twenty per cent of the calendars originally sold in 1929.

When reorders jumped to thirty, then forty-five per cent, the manufacturer increased his orders for refills with considerable satisfaction.

Final returns showed that over seventy per cent of the calendars had been used, kept and appreciated for a full five years and that users were willing to pay for the privilege of enjoying their calendars for another five years. Returns such as these, any advertising or premium man will testify, are phenomenal.

Obviously calendar and date recording fields offer decided opportunities for plastics of all sorts from the pyroxylin, through acetates and cast resins, to the molded ureas and phenolics. One would expect that a great deal has already been achieved in the field and a survey of the present condition of the industry confirms this supposition. Yet, in a manner typical of most plastic-using industries, development has been uneven. For every opportunity seized and capitalized, the inquiring observer can find a dozen that have been overlooked—for every real sales success, he can find

1. With day and date indicators, this clock made by the Hammond Clock Co. has a case of black Bakelite molded

2. This calendar with dates for 900 years is molded of Durez and Bakelite by the American Record Corp. for the Ace Mfg. Co.

3. This five year calendar which achieved phenomenal reorders is molded for New Art Specialties by Chicago Molded Products Corp.

4. Attractive memorandum-calendar stand of Bakelite is molded by the Boonton Molding Co. for Keith Clark, Inc.

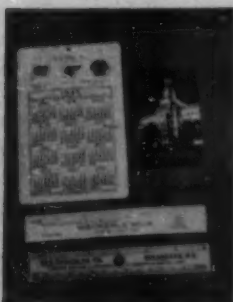
5. Calendars and slide rules are available in a variety of sizes, shapes and colors. Made of Celluloid and Fiberloid

6. A circular calendar with device to determine the exact hour in any part of the world, and similar specialized advertising media of Celluloid and Fiberloid

7. Colorful bases for these two attractive calendars, one with fountain pen equipment, are made of Catalin by Plastik, Inc.

8. Molded of Durez and Plaskon, the Bates Telephone Index presents the effectiveness of redesign.

5.



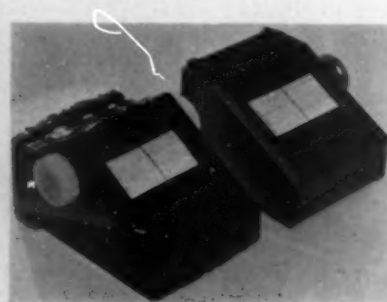
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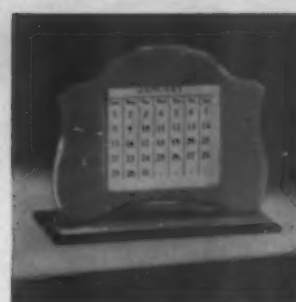
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a corresponding instance in which plastics and profits did not run together.

The mere decision to use plastics will not insure success in this field. A thorough study of the nature of the field must be made and observed. One peculiarity of the industry becomes immediately apparent. The market for calendars is broken into two unequal parts. The smaller end of the field is the one which sells its products through regular retail channels. Here, if profits are to be secured, calendars and similar accessories must be designed and sold as highly seasonal and often comparatively expensive merchandise. The second section of the market considers the calendar or date-recording device as a gift or premium. Here again, it is highly seasonal. Probably ninety-five per cent of all calendars sold are contracted for during a few months and reach the ultimate user either as Christmas gifts or shortly before the advent of the new year.

As premiums or gifts calendars may vary in cost from a fraction of a cent to several dollars. The element of novelty in construction or appearance is of decided importance—often transcending the factor of good clean design. The ability of the material used to permanently identify the gift with the name of the

giver is a major factor governing selection and sale. Because of this, it is essential that materials used and the process of manufacture lend themselves readily to mass production—as a means of achieving low unit costs—and opportunity for changes of identifying



13.

insignia within the mass production process. It is necessary to obtain advertising value by providing such identifications on orders that may run as low as a hundred and as high as a million.

Consider, then, why plastics apply particularly to these branches of the field. In the calendar-as-merchandise division, it is essential that the product be of sufficient strength to last at least a year. In the case of so-called perpetual calendars this life term must extend to ten or twenty years or more. Plastics, particularly molded phenolics, ureas and cast resins, offer the necessary strength.

A second major consideration is appearance. Since the object is to be used over (Continued on page 64)

9. Church envelope holder, molded by American Insulator Co., holds dated envelopes to remind user of his church contribution

10. Executives' memo-calendar produced by Chas. Letts & Co., London, is molded Bakelite and bears an imprinted firm name

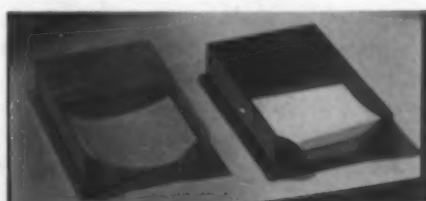
11. Small book cabinet by Holliston Mills has a molded case, with calendar in the panel of a swinging door

12. A boudoir calendar, in laminations of transparent and opaque green Celluloid. Daintily feminine and decoratively useful

13. Business cards become useful and worth keeping when combined with a calendar. Made of Celluloid by Sillcocks-Miller Co.

14. Memo slip boxes have found general acceptance among executives. These by Meck Molding Co. are of (left) Tenite, and (right) phenolic

15. Remembrance items fabricated by J. B. Carroll Co. employ highly lithographed pyroxylin over metal frames. Shown by courtesy of Fiberloid Corp.



14.



15.

NEW IDEAS

● Since ordinary needle compasses do not function correctly on trucks and buses because so much iron is nearby, a new compass has been designed in which the needle is floated on a liquid so that it is always horizontal in spite of rough roads, high speed or vibration. When properly mounted, and adjusted for magnetic influences after being mounted, the instrument is a reliable guide to the direction the vehicle is traveling. The interesting feature is that the housing is made of a synthetic resin. (Kunststoffe, October, p. 261; patented in the U. S. by J. L. Hassel, of Stockholm, Sweden, U. S. Patent 2,019,411.)

● Wood graining effects on celluloid are obtained more dependably and economically than in previous processes by a new German method in which a film or sheet of celluloid is hot pressed against the wood which is to be imitated. When circumstances require it, the wood may be treated with a fat, oil, resin or cellulose derivative for partial or complete pore sealing before hot pressing. When stripped off, the foil or sheet shows the grain in relief; it may be gilded or colored as desired and then applied to the surface to be decorated. (Friedrich Huth, Kunststoffe, October, p. 255.)

● The compounding of synthetic resins with rubber for making molding compositions has occupied the attention of a number of investigators, but mostly in the rubber industry, with the object of incorporating relatively small amounts of synthetic resins in rubber. Approaching the problem more from the standpoint of the plastics industry, with a view to incorporating rubber in plastic compositions, The Chemical Laboratory of the Technische Hoogeschool in Delft, Holland, has succeeded in making mixtures in which the synthetic resin predominates. This is done by adding an alkaline solution of a phenolic resin to rubber latex, and precipitating with acid. A molding powder is obtained which has numerous advantages and uses for making shaped articles. (H. I. Waterman, C. van Vlodrop and A. R. Veldman, Chemisch Weekblad, Nov. 2, pp. 622-4.)

● There is a large potential market for cheap goggles to shut out the glare of sun or

of snow. As hitherto made of celluloid or Cellon, molding of goggles was a complicated process involving numerous operations, which necessitated a relatively high selling price. Injection molding is the logical answer to the need for low cost mass production; and the details have now been worked out to permit efficient manufacture of goggles by injection molding, at the rate of about 2000 pairs of goggles in an 8-hour shift. The molding operation has been so far simplified that the molds can be placed in the machine in about 30 minutes, and thereafter the finished moldings are automatically discharged with absolute regularity and uniformity, turning out about 4 completely molded goggles per minute, needing only to be reamed for insertion of the celluloid lenses. (Gastrow, Plastische Massen, November, pp. 321-325.)

● The Dental Show in Berlin, in October, afforded an excellent opportunity for display of what plastic products have done for the dental goods industry. Though replacements of actual teeth must still be made of inorganic materials, the synthetic plastics have invaded this field in the manufacture of molded teeth for instruction purposes in the dental colleges; urea-formaldehyde resins are preferred for this type of product. Ebonite, which for decades shared the denture field with celluloid, may have to yield to a new tasteless, odorless, light, hard but elastic synthetic plastic which is not sensitive to temperature fluctuations and is quite inert to water and to bacteria. This material is molded at about 130° C. under a relatively high pressure. Dentists are also coming more and more to favor molded plastic containers for small articles such as drill bits, and for cement. There are also special containers, made by injection molding, for drill bits. Molded arm and head rests on dental chairs are not unpleasantly cold to the patient, and are more sanitary and easily cleaned or sterilized than leather or wood. (Pabst, Plastische Massen, November, pp. 329-330.)

● Austria is taking the lead over Germany and other European countries in the use of impregnated paper as a substitute for veneer in automobile construction, especially in buses. Whereas Austria has abundant tim-

ber and has to import the synthetic resin impregnated paper, the situation is rather the reverse in Germany, which has been slow to take advantage of this opportunity for improving domestic trade. The paper and resin product is superior to wood veneer in lightness, uniformity of appearance, adaptability to structural shapes, resistance to moisture and temperature changes, fire-proofness and freedom from splitting. (Ker, Plastische Massen, November, pp. 331-332.)

● The use of rubber in printing, e. g. for printing rolls or blankets or the like, has numerous advantages but is handicapped by certain limitations in the rubber, chiefly its sensitivity to the oil in printing inks. Use of rubber forms is now facilitated by the use of a synthetic resin matrix, the preferred material for which is a phenolic resin of the "Novolak" type. The synthetic resin matrix provides certain properties which are not found in rubber; thus each material serves its own purpose and good printing results. (Oscar Klot, French Patent 775,789.)

● A cheap but useful composition for making doll heads and other molded shapes is prepared from wood flour and a powdered textile material, mixed with glue and a powdered resin (which may be rosin), made up with water, and molded in a press at 50-200° C. The mold is perforated or grooved so that liberated steam can escape during the molding operation. The same composition can be used to make inexpensive sheet materials. (Rene Lecuyer, French Patent 764,510.)

● An impression material for making dental castings must meet some exacting requirements because of its use in the patient's mouth. A new plastic impression material which is particularly satisfactory is made of a wax, a thermoplastic resin, a balata-like material which is also thermoplastic, an emulsified oil and a gelling agent which assists in setting the material after an impression has been made. Laurence E. Harrison, Oramold Products Corp., U. S. Patent 2,021,058.)

● Superior sound records are now made from a cellulose ester or ether and a natural or synthetic resin (preferably acaroid resin), by grinding the resin and the cellulose derivative together without adding any plasticizer, to a fineness of 200 mesh, then adding the plasticizer, grinding in a Kek mill and sheeting on hot rolls. The resulting sheet plastic is eminently suited for making phonograph records. (Gramophone Co., French Patent 739,904.)

American laminated on British ships



The first class smoking cabin exemplifies the spacious comfort afforded to passengers on the SS. Orion as do these two staterooms in which Formica is used for built-in tables, stands and chests

WITH the winter cruising season well under way it seems appropriate at this time to indicate some measures taken by steamship lines to increase the comfort and safety of their passengers at sea.

Taking the R.M.S. "Orion" of the Orient Line which was recently completed in Great Britain, for example, we illustrate its gallery and lounge as well as two of its staterooms to show how deeply the trend of modern decoration has penetrated into steamship design. In such a setting there is no more appropriate material than laminated plastics for wall coverings, table tops and other furniture which are expected to retain their good looks despite wear and abuse which they unquestionably receive.

Fire, the greatest enemy of ships at sea, finds laminated plastic a tough material in which to get a start. For this reason laminated is used for the tops of smoking tables, bureaus, buffets, etc. in public rooms and staterooms where cigarettes are most likely to be carelessly laid.

Since the development of laminated plastics has progressed more rapidly in this country than in England, that used on the Orion as well as that being installed in the new Cunard White Star passenger steamer "Queen Mary" now under construction, is Formica, manufactured here and exported to England. This modern material has been developed in colors and qualities by American chemists that have not been matched by the output of European plastics manufacturers up to the present time.

In the SS. Queen Mary, the largest and finest in the world, a very large amount of Formica is being used as finishing material. Wall covering in 250 bathrooms of first class de luxe cabins (Continued on page 63)



Anyone would feel quite at home in this delightful first class gallery of the SS. Orion with its gaily striped chairs and spacious lounges. Formica protects the table tops from careless smokers



PLASKON

TREE ORNAMENTS:

Claus is carrying Plaskon tree ornaments this Xmas. But if you're cynical, the new Noma-Lites and Glo-Lites can be obtained at almost any department or chain store. That is if you move swiftly: we understand that the 3,000,000 sets shipped are going like hotcakes—that they're the Xmas decoration find of 1935.

It is a good idea to make plastic ornaments. They are easily manufactured and cost less than

fragile glass ones. They're the most colorful and the safest because Plaskon is non-inflammable. A new type hook-up and Plaskon's dielectric strength are comforting insulative features. With Noma-Lites, the "ahs" change not to "ughs," and shivering Santas are spared the last minute rush to replace a short circuited set.

The material choice rested mainly, of course, on color and durability. Breakage in box car and in the home means slim profits and disgruntled customers. Plaskon reduced breakage to a minimum. As easily obtained was the gay spectrum of Xmas color. In Molded Color's infinite range, Mr. Henri Sadacca (thinker-upper of Noma-Lites and Glo-Lites) found not only color, but translucence. He says Plaskon is ideal for his purpose. We quickly add that you may find it just right for yours.

The sets are molded by the Plastics Department, General Electric.

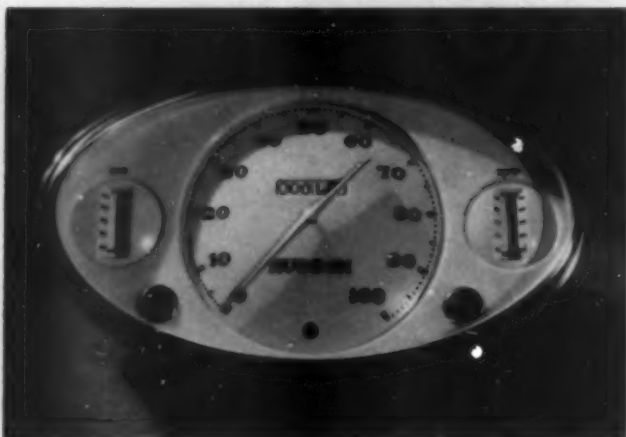


MOLDED COLOR

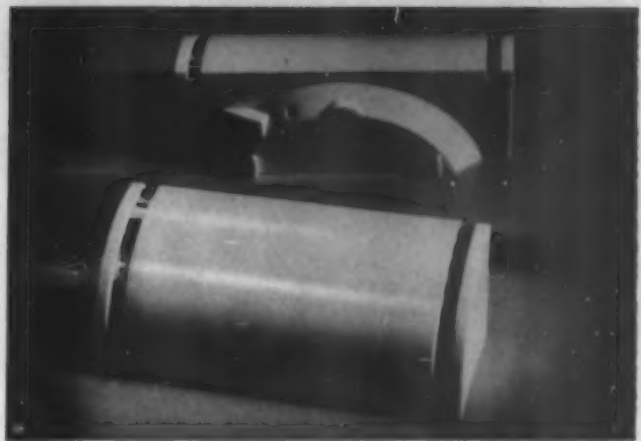
CHRISTMAS 1935

SPEEDOMETER DIAL:

The appearance of Plaskon on many models at the Automobile Show wasn't the most important indication that American business is getting there, but it showed quite plainly what manufacturers are using for interior fittings. Molded Color in the form of domelights, dials and window regulator and dashboard knobs has been a standard accessory for some time. Reasons: It can match any



upholstery; it will not chip, check or discolor. In the case of Hudson, Plaskon translucence is again the big reason for its use. The large 1936 speedometer dial is illuminated by a concealed light. With translucent Molded Color (ivory in this case), m. p. h. and gauge readings are easily seen at night, and the soft light doesn't distract the driver. Chicago Molded Products Corporation is the molder of the piece which is used, with variations, on many makes.



LAMP SHADE:

Plenty of light for cooking is part of every good recipe. By equipping ranges with individual lights the Cleveland Cooperative Stove Company helps housewives prepare tastier Xmas turkeys. And helps dealers sell Cleveland ranges. Logically enough, the plastic with dielectric as well as high tensile strength was chosen for the lamp shade. Plaskon's "moldability" (neatly apparent above) and its great color range are other reasons why Molded Color is favored for every type of lighting fixture. Molded by American Insulator Corp., in New Freedom, Pa.

Merry Christmas!

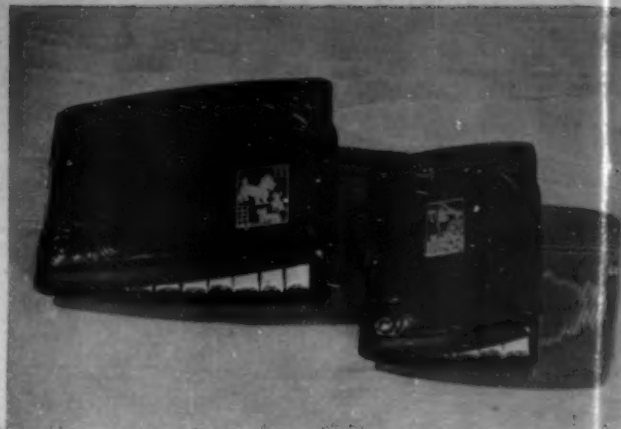
TOLEDO
SYNTHETIC
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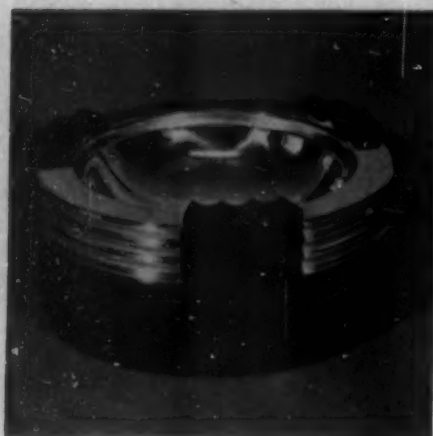
← The coaster-ash tray molded by Boonton Molding Co. for Artleigh Products Inc., combines a number of uses in one practical, space conserving item. Various colors such as white, red, green and yellow make it easy for players to keep track of their own drinks as they move about in a pivoting game



For their "Private Stock" → rye whiskey Park & Tilford Distillers, Inc., have adopted a non-absorbent Bakelite molded flange with cork closure. Rich in appearance these black caps are made by Armstrong Cork Products Co., and contain the traditional Park & Tilford trademark insignia for identification



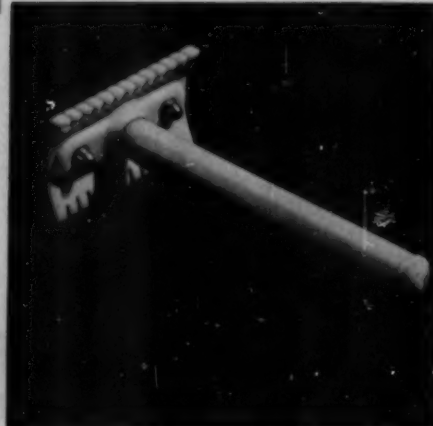
This miniature molded chest of drawers has a dual use—a dressing table accessory at home or rubber band, pencil or eraser container at the office. Although only five inches high it has four drawers. Made by Whitbro Products of Bakelite molded in attractive color combinations as well as black



← This new Wing Ash Tray made by Chase Brass & Copper Co., with a base of black Bakelite combined with shining chromium is ideal as a man's gift for the desk in the office or at home. Ashes are dumped from sight by a turn of the button at the side



This new white molded → razor is an addition to the new line of the Conrad Razor Blade Co., Inc. The razor comes in two parts, easy to clean and operate and is claimed to be perfectly balanced. Molded in white, black or green, the razor has a nickel finish metal cap



This is the new Shaver's Set being put out by the American Safety Razor Co., with their Gem razor. The main feature of the set is the Beetle shaving bowl, molded by Mack Molding Co., which contains Lightfoot Schultz soap. The color scheme of the set is royal blue and gold with royal blue bowl



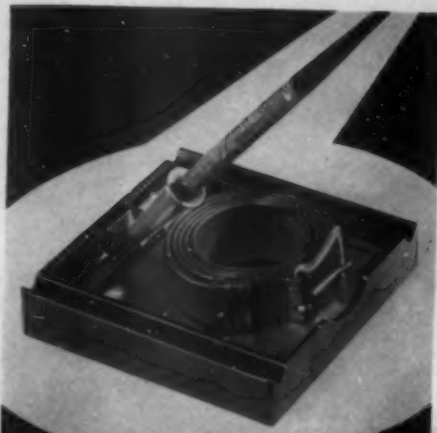
← The Bylax Hygienic Tooth Brush Holder is announced by its inventor Dr. David Beilock. It is an attractively designed wall case of Bakelite and Plaskon accommodating four brushes and has a red swivel holder. A vial of germicidal powder supplied with each holder keeps the brushes sweet



← Easy to open and easy to close because of a special spring hinge these new molded cigarette cases made for Emil Lackow by Waterbury Button Co., are convenient additions to the modern smoker's equipment. Made in ebony or mottled walnut Bakelite combined with small artistic chromium inlays of different design



← A new synchronizing timing light has been announced by the Stromberg Motoscope Co. and features a self-insulating molded Durez case to prevent ignition shocks from reaching the operator's hand. The instrument is exceptionally light in weight and cannot scratch, peel or dent with rough usage



← Here is a Christmas gift that will delight any man or boy lucky enough to receive it. A combination belt and pen set with the container base and pen holder molded of Resinox. Practical and attractive, this gift set is manufactured by Arthur Hyde

developments of the month



↑ For five meter two-way police communication, Universal Microphone Co., announces a new combination Microphone and earphone entirely molded of black Durez. Because of plastic material it is self-insulating, light in weight, pleasant to touch, with a finish that cannot chip or wear off

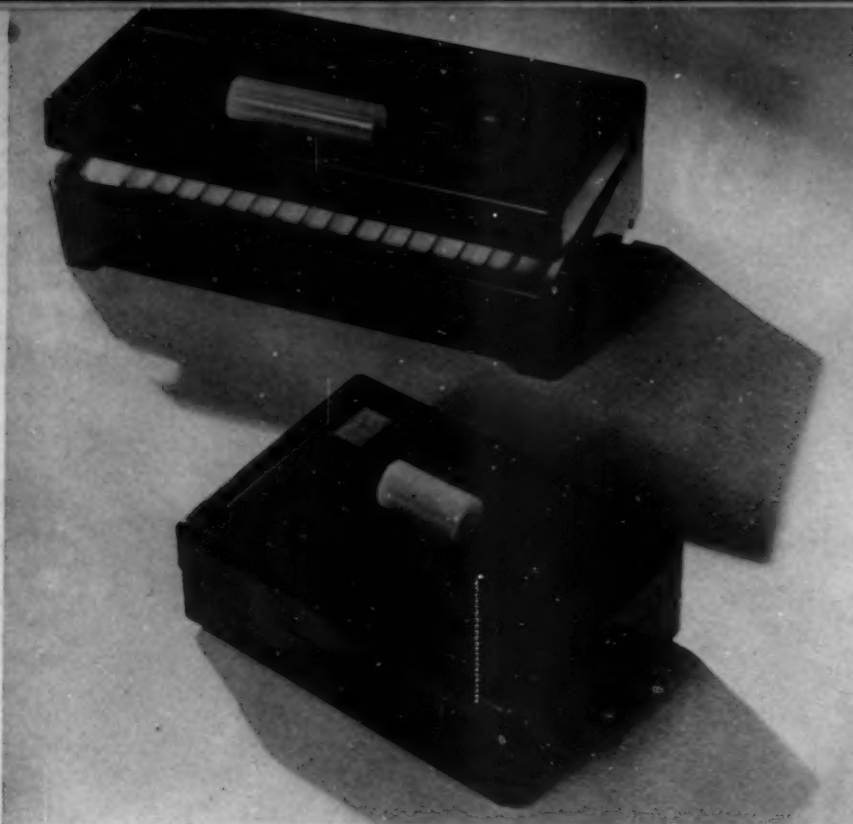


← For a merry Christmas, Hickok gift items are packaged in molded Bakelite and Plaskon reuse containers. Belts and buckles, stud sets, tie and collar clasps are presented neatly in potential humidors, jewelry boxes and ash trays. Colors include black, mottled green, and walnut finishes combined with attractive inlays

developments of the month

A new line of utility cigarette boxes has been created by Industrial Plastics Co., of black Bakelite molded with attractive red cast resinoid handles. These boxes give further evidence of the versatility of plastics and the effect achieved by combining two different types of plastic materials in intelligent design

The age old game of cribbage reappears with a modern molded plastic board and a removable cover. The Terkelsen Machine Co., is producing this board in various colors of mottled Bakelite. There is sufficient room for two packs of cards and for the polished brass pegs



One of the latest novelties to appear in molded plastics is this combination stamp pad and rubber signature plate. Manufactured by the Midwest Molding Co., of scarlet and green Durez it is neatly combined in one unit and is easy to handle although little larger than an ordinary aspirin box

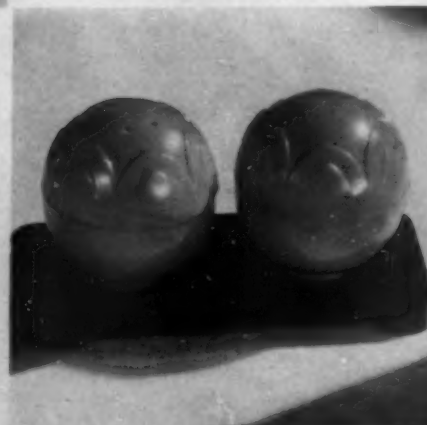


This case by the Hamilton Watch Co. will complement any Christmas gift of a lady's watch. Molded of Plaskon by the molding division of the Armstrong Cork Co., the casket attains an old, hand-carved ivory appearance by retaining certain irregularities in the mold. Designed by De Vaultier & Blow, Inc., industrial designers



These various types of thermometers are manufactured by Germanow-Simon Machine Co., for walls, desks, ovens, mantels and refrigerators with face covers of a special formulation of Lumarith unbreakable crystal. It is claimed that the thermometers withstand severe temperatures, will maintain their absolute transparency and do not yellow with age

Salt and pepper sets that lend color to table decorations. Molded of orange Plaskon and resting on an ornamental stand of black or brown Neillite, these shakers are durable and attractive. The tops with perforated holes of different sizes screw tightly to the bases so there is no danger of their falling off accidentally in use



Jewelry prefers resins

BY BISSELL BROOKE
AMERICAN CATALIN CORP.

C AST phenolic resins were not left at the post in the annual race with other materials for supremacy in winter jewelry and trimmings this year. For the first time, jewelry of cast resins, both in whole and in part, has become practically essential to milady's winter wardrobe. Indeed, this jewelry has become as obvious as the annual crop of debutantes.

For, cast resins have strengthened their position in the winter field by reproducing the new colors introduced into fabrics and textiles by Paris—deep, rich

4



1



1. For sportswear with woollens and tailored frocks, this combination of Catalin and wood, joined with leather thongs offers a smart accessory note. A pair of shield shaped clips with matching bracelet are in perfect harmony with this brown woolen frock

2



2. One of the most striking new evening and formal afternoon accessories is the smart new jeweled Catalin cigarette case designed and manufactured by the Fillkwik Co. The bangle bracelet and circular pin of crystal, studded with simulated gold metal stars, is a product of the Albert Manufacturing Co. This is only one of the many applications in which cast resin jewelry has been found to harmonize with any gown for any occasion

3



3. An unusual fob trim for a white sweater. A large round piece of black Catalin, with faceted surface, hangs by three silver metal links from a circle of the Catalin, made by Lidz Brothers. The matching bracelet from Cahn & Co. is two inches wide with a half inch band of silver braid running around the center.

4. Miss Georgette McKee, popular ingenue of the New York stage, is shown wearing the newest thing in the "animal kingdom." Catalin frogs in a jade green form one of the amusing motifs of these Twin Pet Clip sets by Nat Levy & Co. With the clips Miss McKee has chosen a matching green bracelet of Catalin combined with a corded metal strip. The bracelet is from D. Lisner & Co.

the center of the clips, earrings, and brooch, with two golden bangles on either side of the sawtoothed bracelet.

Exceptionally striking for sportswear, is the innovation of malacca, flanked smartly by a transparent and opaque resin. This creation comes in complete jewelry sets, with matching buckles and buttons. Another popular sport button and jewelry ensemble has rectangles of wood and opaque resin laced together with leather thongs. (Figure 1.)

For the more dressy occasions, quaint nosegays of resin

Renaissance shades, bespeaking both elegance and chic. Moreover, cast resins have gone further and produced their own novel colors and combinations. The much heralded "Shell" is such an exact copy of real tortoise shell that even a tortoise could be fooled. The jade imitations have all the markings and flare of the genuine product.

The versatility of cast resins in combining with other materials, first emphasized in spring jewelry, opened new vistas to designers for this season. Gold and silver finished metals were given a dashing color note with tips or alternating strips of the cast resins. At present, metal more often plays the secondary role, being used as a contrasting note for the resin. One bright jewelry set has a slender band of corded metal down the center of each piece to give a smartly tailored effect. Another has thin circles of metal in

flowers nestle among gold leaves. Evening and cocktail accessories dazzle in a combination of rhinestones and cast resin. There is a wide choice of jewelry, buttons, buckles, and clips—triangles with sparkling edges; a vivid, flame-red square, with a hole in the center crossed diagonally by a rhinestone rod; fan shaped clips and buckles segmented by lines of rhinestones, to mention only a few. Unusually smart and elegant is a gleaming gold button, buckle, and clip ensemble. It is made of a cast resin plated with 24 carat gold. This makes it non-tarnishable and the cast resin accounts for its unusual light weight.

From the above, it is obvious that a button is no longer only a button. In response to the feminine demand for that filled look, in this accessory conscious age, every item in an ensemble must blend and match. And not only match, (Continued on page 56)

Keeping posted

New automatic molding plant

Believing that industrial progress lies in diversification, the Erie Resistor Corporation, pioneer carbon resistor manufacturer for the radio industry, has installed a division for custom plastics molding. Automatic molding equipment places this company in a superior position for furnishing extremely large quantities of molded goods in comparatively short production time. For designing or redesigning products the Erie Resistor Corporation is in a position to furnish suggestions in the form of sketches and drawings from the hand of a well known industrial artist.

High dielectric fatigue material

Many electrical applications for molded plastics, especially the newer high tension automobile ignition parts, require a much higher dielectric breakdown and dielectric fatigue than was possible with ordinary molding materials. To meet this demand, General Plastics has developed a material called 2491, available in black, brown, and red, which meets these requirements. Most of the rotors and coil caps for the 1936 motor cars are being made of this special molding material. According to A.S.T.M. tests recently completed, Durez 2491 has a dielectric breakdown of 550 V/M, and a dielectric fatigue of 400 V/M/M. When exposed to high tension current leakages, this special material resists the formation of carbon tracks or arcing channels, which results in the carbonization of ordinary molding material under the intense heat.

Football party

Ninety men of the Toledo Synthetic Products, Inc., attended the Ohio State-Michigan football game at Ann Arbor on Saturday, November 23. The president and other officers of the company, and representatives of the manufacturing staff made up the party. The plant was closed for the day.

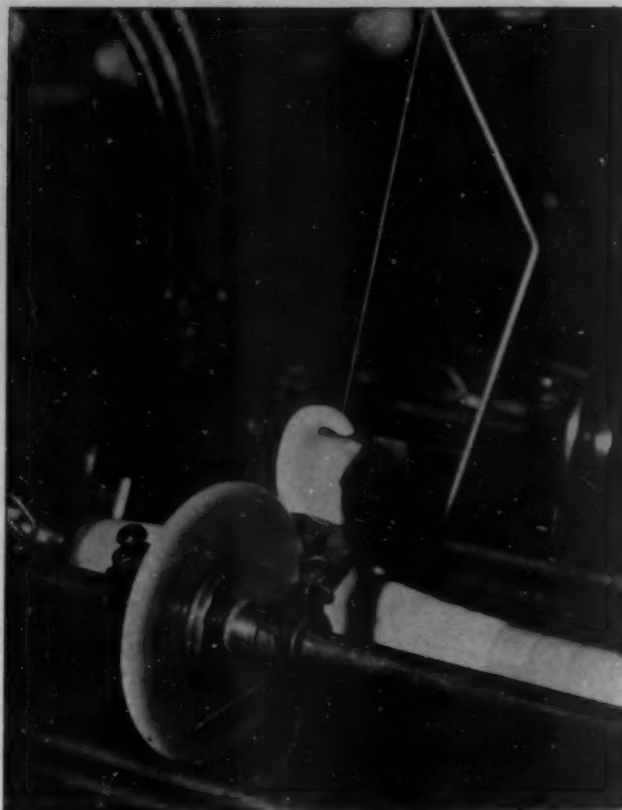
New directors for G. E.

At the meeting of the General Electric Company's board of directors, in New York City on November 1, Henry S. Morgan and Robert C. Stanley were elected members of the board to fill vacancies. Announcement was also made of the resignation of Thomas Cochran, former director, who resigned because of ill health.

Mr. Morgan, a son of John Pierpont Morgan, was until recently a partner in the firm of J. P. Morgan and Company, and is now a director and executive officer of Morgan, Stanley & Co., Inc. Mr. Stanley has been president of the International Nickel Company.

Designer moves

George Switzer announces the removal of his studio to 336 Central Park West, New York City. The new telephone number is RIverside 9-7124.



New traverse wheel of Tenite on modern cop winder

Superior to steel discs

Wheels of cellulose acetate plastic have been found superior to steel discs as traverse wheels on copping machines, which wind yarn on the cops or quills used in weaving cloth. The photograph shows a traverse wheel of Tenite on a modern cop winder. This wheel, carrying the thread guide, is driven back and forth on its threaded axis by contact with the rotating cop of yarn.

When the disc is made of steel, its contact with the yarn creates broken filaments despite all efforts to produce a high polish. The use of a cellulose acetate disc practically eliminates this trouble, since the high polish obtainable on this material produces a smooth surface which will not injure the finest filaments.

The acetate disc has a special hub which makes replacement a simple matter of unscrewing a nut, removing the old wheel and substituting the new wheel in its place.

New water-dilutable resins

New water-dilutable resins offering important improvements in the manufacture of laminated sheet stock and rolled and molded tubing, have been announced by Bakelite Corp. This new development reduces water absorption of laminated materials, thus prolonging life and strengthening electrical properties. Varnishes based on these water-dilutable resins, employed alone or in combination with other types of resinoid varnishes, offer interesting possibilities to industries concerned with the problem of corrosion and resistance to chemicals. This development has made possible the manufacture of "refinishing" laminated material for table tops, baseboard trim, wall paneling, etc., where resistance to water staining is essential.

MODERN PLASTICS

IS YOUR MAGAZINE

Entering the New Year, we are particularly anxious to slant this publication in a direction that will bring maximum benefits to the greatest number of our nine thousand readers. To do this we ask your advice.

If you want more articles about technical developments in plastics—tell us! If you want less of these—say so! If you want more stories on merchandising and design—let us know!

In order to make it easy for you to tell us just what you would prefer in MODERN PLASTICS for 1936 we publish this list. Checking it incurs no obligation, nor need you sign your name if you prefer not to, but the information you can give us by returning the coupon below will be helpful in making MODERN PLASTICS a better publication in 1936. More than that, we shall be deeply grateful.

TELL US WHAT YOU WANT!

Which of these monthly features do you find most interesting?

- ☐ New Ideas
- ☐ Developments of the Month
- ☐ Stock Molds
- ☐ Editorial
- ☐ Keeping Posted
- ☐ Books of the Month

Which, if any, would you like discontinued? What features would you like to have added?

.....
.....
.....

What subjects would you like to have covered more often in our editorial content? Number them in the order of your preference.

- ☐ Architectural applications
- ☐ Molding applications
- ☐ Cast resin applications
- ☐ Engineering application
- ☐ Interviews with industrialists
- ☐ Industrial design
- ☐ Molding technique
- ☐ Fabricating technique
- ☐ Engineering design
- ☐ Interviews with retailers

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MODERN PLASTICS

BRESKIN & CHARLTON PUBLISHING CORP.
425 FOURTH AVENUE, NEW YORK CITY

Keeping posted

(Continued from page 42)

Synthetic rubber molding compound

The Thiokol Corp. has developed a molding compound of synthetic rubber which can be molded much the same as phenols and ureas, curing almost as fast. The compound (Thiokol) in its molded state is fully vulcanized and is unaffected by gasoline, oil or exposure to air and sun which recommends it highly for many industrial applications where natural rubber or other materials would be inadequate.

Experiments are now under way to develop and perfect a molding technique which will place the material at the disposal of every molding plant in this country. Progress of the development will be reported in a later issue of MODERN PLASTICS.

Using casein waste

In the September issue of Chemiker Zeitung methods for using the wastes from formaldehyde-hardened casein plastics were suggested. When ground to a fine powder the waste can be remolded by first compressing in cold molds before fusing by application of heat. The finely powdered waste is also an excellent filler for rubber erasers as its action upon paper is not so drastic and it can be easily colored. For converting into a form suitable for adhesives, the waste is exposed to a current of ammonia gas when the formaldehyde is converted into hexamethylene tetramine, leaving the casein in a soluble form. The latter yields a good adhesive in admixture with 3 per cent borax. The ammonia-treated waste is also claimed to be a rubber vulcanized accelerator, thiourea being formed in contact with hot sulfur.

Pioneering a new publication

SHIPPING MANAGEMENT—a new magazine designed to cover the needs of the men, methods and materials of the world of shipping will be published by Breskin & Charlton Publishing Corp. The first number will be issued January 1936. Just as MODERN PLASTICS presents the ever changing trends and evolution of plastic merchandising—so SHIPPING MANAGEMENT has been developed to serve a hitherto neglected group whose use of materials, equipment, and services is estimated in excess of \$4,000,000,000 a year. And just as the former publication entered its field at a time when tremendous developments were beginning—so SHIPPING MANAGEMENT finds itself surrounded with impending changes of momentous importance in the field of shipping and distribution.

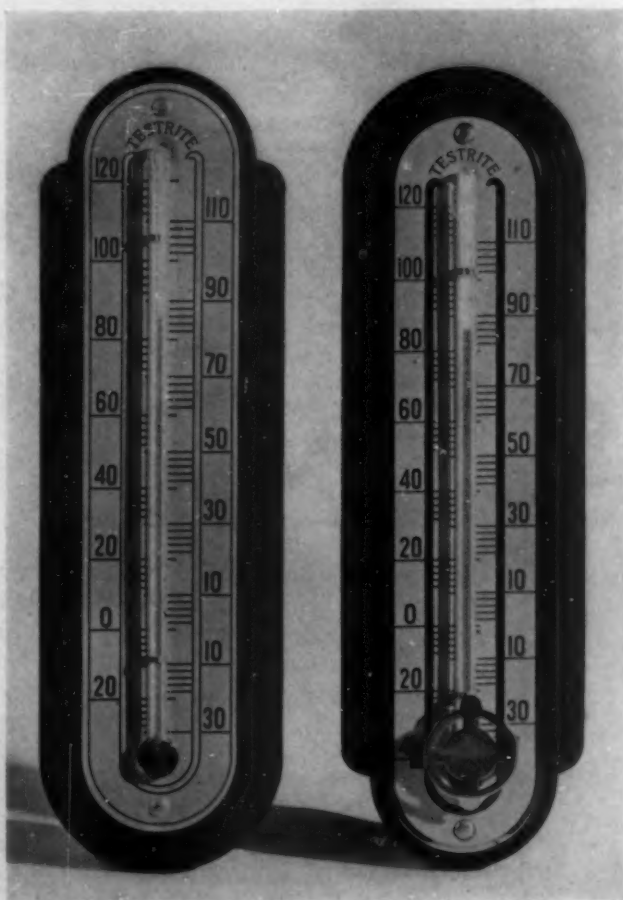
An initial circulation of 15,000 will be raised quickly to 25,000. Estimates based on a survey of representative American firms indicate that there may be as many as 50,000 whose yearly shipments average between 40,000 and 50,000 units each. (The arbitrary measuring stick for "volume" shippers.) SHIPPING MANAGEMENT will go to the shipping department manager of each firm and will deal with the problems of rates, and regulations of containers, labels, sealing, marking and weighing equipment, storage, and handling, record-keeping, choice of packing and shipping

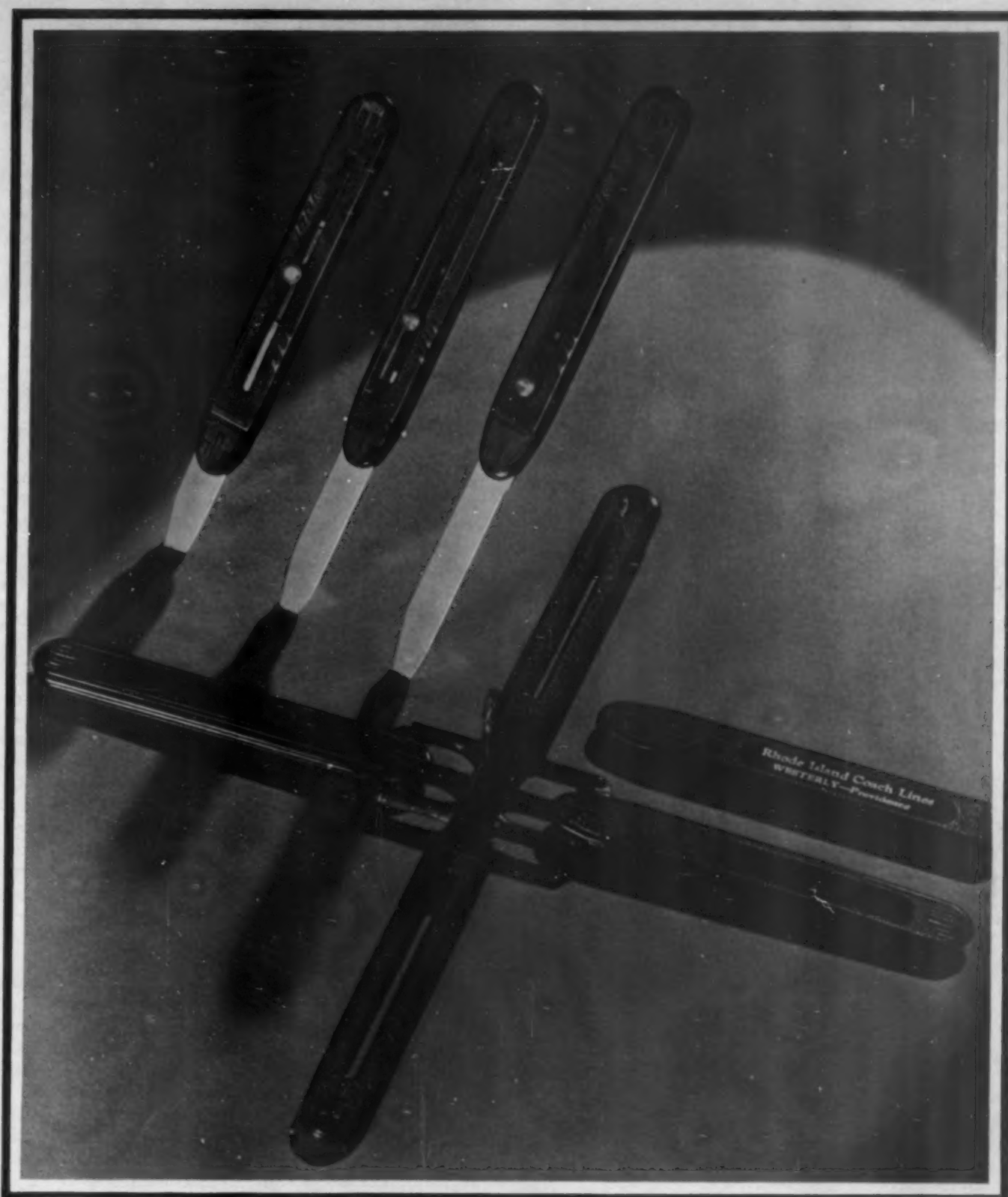
methods, and with the results which each business wants from the organized management of its shipping department. By the use of a unique survey, which followed upon more than a year's careful contact with the field, the new magazine has been made-to-measure in advance. Its contents have been set by the very men who will read it.

Joseph Blue, whose connection with the shipping field began in 1923 with his position as advertising manager of the Corrugated Paper Mills (now the Natick plant of Container Corp. of America), will serve as editor of SHIPPING MANAGEMENT. Editorial and advertising offices will be maintained at the new Boston office of Breskin & Charlton Publishing Corp., 143 Newberry Street; as well as at Chicago.

How cold is it?

THAT is a question confronting most of us nowadays. Mr. Neuwirth of the Testrite Instrument Co. decided to supply an answer to that question. He was familiar with the ordinary difficulties that a thermometer manufacturer would have to surmount and, therefore, decided to start the development of a new instrument with an open mind and avoid any hangover from the old method of thermometer manufacturing. Experience indicated to him that design was an all important factor in the sale of such instruments. For that reason, Walter Von Nessen, industrial designer, was requested to submit suggestions for the basic design of a new thermometer. He did a very clever job as will be seen in the illustration. The design is modern enough for those people who are attracted by the use of that (Continued on page 46)





Gits knife handles of TENITE
molded by Erie Resistor Corp.

TENITE is adapted to the rapid injection molding of many types of products, with resultant low production costs. The Gits knife handles, shown above in cast and finished forms, are typical of the injection molded products now being made from Tenite. Unexcelled in strength and color range, Tenite is the ideal plastic for many industrial and decorative uses. Send today for samples and illustrated booklet on Tenite.

TENNESSEE EASTMAN CORPORATION (Subsidiary of Eastman Kodak Co.), **KINGSPORT, TENN.**

Keeping posted

(Continued from page 44)

word. The piece, however, is conservative enough to please those who do not feel that the phrase "we moderns" applies to them. The stepped sides catch the highlights which are considered so important in the display of such merchandise. Keyholes molded into the back permit hanging without any fuss or bother and eliminate the need of assembling special hooks or eyelets.

To meet certain price conditions, the glass tube was mounted on a silver metal with black numerals and that assembly in turn riveted to black or brown thermometer backs.

By turning the design upside down, spending more money for the metal plate and using colored plastics, it was possible for Testrite Instrument Co. to reach another higher price outlet. You will note from the illustration that a guard was also added to protect the bulb at the bottom of the glass.

Dealers have received this new item with tremendous enthusiasm and declare that it is one of the best thermometer values they have seen in years. This constitutes another example where coordination of a good design and molding engineering lead to good sales. These thermometers are molded of Bakelite by Boonton Molding Co.

Correction

The visor for windshields to protect the driver from the glare of night and day driving—illustrated on page 32, November MODERN PLASTICS—was incorrectly described as being made of Celluloid. The material used is Lumarith, a product of Celluloid Corp.

Questions from readers

Who is the manufacturer of "Arinite" and what are its properties and uses?

Who makes "Dacoware"?

Answers

Question: Who makes "Shalorite" (Nov. issue)?

Answer: "Shailorite" is a product of Shailorite Mfg. Co., 40 West 20th Street, New York City. It is a material which this company treats with acetate in secret formula and uses in the manufacture of phonograph records and for similar purposes.

Question: What is the address of Molded Displays, Inc. (Nov. issue)?

Answer: Molded Displays, Inc., 60 E. 42nd St., New York, has been organized to manufacture indoor and outdoor signs, counter and window displays, trademark figures, premiums, advertising novelties and novelty packages of molded paper pulp. Roy Sheldon, formerly with Calkins & Holden, advertising; Industrial Design, Inc.; and Kay Displays Inc., is president.

Books of the month

Flexible seamless connections

The American Metal Hose Co., branch of American Brass Co., announces a perfected flexible seamless steam connection with brass bracket support for movable platen presses. Since there are no joints, no welds, no laps, no seams, no packing, this flexible connector eliminates maintenance costs. It is reported that American Flexible Seamless Connections with support will stand constant flexing indefinitely and remain tight. For services such as the conveying of steam, constantly or alternately with cold water, at any temperature and pressure, nothing has ever been produced to equal this remarkable new development.

Actual flexure tests under steam pressure prove that it will outwear any flexible metal hose or tubing ever put on the market, it is claimed. Manufacturers of rubber goods or molded plastics will welcome this new development. It means increased efficiency and, above all, the elimination of maintenance costs. A twenty-page catalog will appear in the near future but those who want more immediate information may have a small descriptive folder which is now available.

Modern conveniences

Three very attractive booklets came to our attention recently from Westinghouse Electric and Manufacturing Co.—"Air conditioning brings health and comfort to the house," "Ice by wire" about electric refrigeration, and "You'll sing at your work," a delightful presentation of kitchen progress from fireplace days to the ultra modern kitchen of the moment. The opportunities for plastics in these modern settings are infinite but their mention in the booklets is rare.

Decorative Art 1935

The Studio Publications, Inc., cloth \$4.50

THE Studio Year Book although published some time ago seems worthy of mention because it is an attempt on the part of the publishers to present the trend of decorative art today with a great number of illustrations to clarify their statements.

Severity of thought and design has eliminated a great deal of drabness and decrepitude and designers are striving for practicality expending in certain cases amazing ingenuity on space and labor-saving devices. It is unfortunate, perhaps, that with a premise of practicality that plastic materials have not been brought more prominently to the foreground. Such advocates of synthetic materials as Donald Deskey, George Sakier, Gilbert Rohde, Henry Dreyfuss and Walter Dorwin Teague although duly represented in this book have not used plastics in their designs as profusely as one would expect.

Of course, it is hardly fair to say that plastics have been entirely neglected because in this book containing approximately 350 illustrations there are some interesting applications. For instance, Howe and Lescaze have designed a (Continued on page 49)

(Continued from page 46) laminated panel for bordering the wall over the mantel of a studio living-room making the separation of dining alcove from living-room more distinct. The kitchen and its accessories have a number of plastic applications some of them stipulated, but for the most part, the materials are seen and determined by the reader only from the photograph as no mention of them is made.

Opportunities for increasing the much emphasized "practicality" of living quarters by the use of plastics have been overlooked, but the book is a worthwhile presentation of interior decoration and includes valuable suggestions for modern furnishings.

As a woman sees design

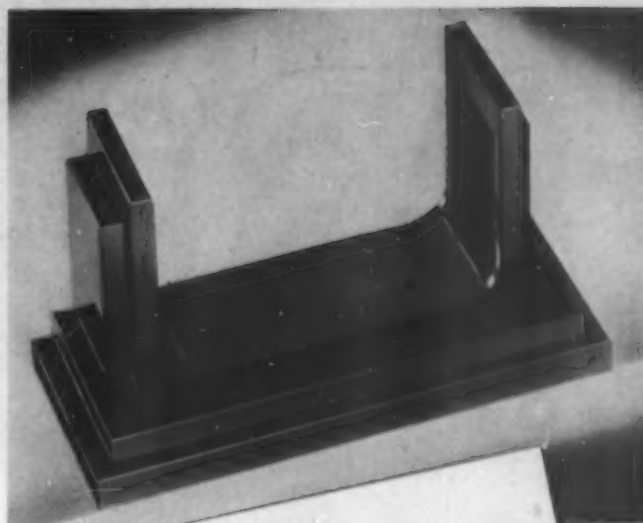
(Continued from page 17) shakers for Quaker Silver Company. With this experience, she realized that plastics were to become important materials in a more modern world. She was right. Today more and more general use is made of these materials, and their possibilities are being exploited daily by alert manufacturers with unquestionable success.

As an artist, Miss Kogan is naturally sensitive to color and form. She deplores each error of design where plastics are misused. "It is most unfortunate, indeed, that manufacturers fail to take full advantage of plastic materials in creating new designs. There is too strong a tendency to imitate the materials used previously or at least to imitate their form and design. It should be realized that with new materials which can be so cleverly molded and machined, new forms are not only possible but are to be desired, and we must try to discover these new applications," she declares.

Miss Kogan believes radios should be designed along simpler and smarter lines than are evident in those created in wood. She foresees a wider use of plastics in dishes. She predicts that when plastic dishes are given greater detail in design, so that the surfaces will not appear barren to the feminine buyer, that a complete dinner service in plastics will be a perfectly logical factor in the modern home.

In spite of an occasional impatience with what she considers "lost opportunities" in plastic design, Miss Kogan believes the plastic field has gone through a relatively short period of bad design. There has been very little static acceptance of the material, both from a design and a manufacturing viewpoint. In general, both designer and manufacturer have felt that with a new material they must do new and interesting things. The host of articles on the market today, which employ plastics in an ingenious and clever manner, are witness to the excellent treatment given to the material.

Recently, Miss Kogan designed two sets of toilet-ware for the Celluloid Corp., which are particularly interesting for their treatment and are indicative of her psychology when designing in plastics. The toilet articles are developed in Amerith, a translucent material of great depth and distinction. In designing, the plastic surfaces were left entirely unadorned, so that the beauty of the material would not be hidden beneath any superfluous decorations. As a relief from the plastic, she indicated the use of rhodium plated handles of unique design.



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MOLDINGS**
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The topmost illustration above shows a clock cradle; the other view shows two small parts with a number of ports and brass screw inserts. We make our own molds, too.

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SOUTHWARK

In toiletware, Miss Kogan believes the manufacturer can benefit by comparing so many of his items with other, more effectively designed objects. He certainly must find then that scroll work, developed in enamels of metal ply stripings, is decidedly on the decline, and he will omit such devices from his merchandise. He will realize that it is no more expensive to produce a modern, well-designed line than one definitely outmoded in today's market.

The toiletware sets for the Celluloid Corp. are in two patterns: *Capri*, distinguished by its strict adherence to straight lines; and *Continental*, developed wholly in curves. Because of their form and design, these sets can fit as gracefully into the home decorated along strictly modern lines as they can into the home which finds greatest enjoyment and comfort in period styles. The sets are developed in rose quartz, jade, amber, lapis, and marble.

"Some study on the subject," says Miss Kogan, "reveals that a preponderance of the objects developed in wood or metal can be reproduced with more satisfactory effects in plastics. On the other hand, articles well executed in plastics are almost impossible of reproduction in other materials."

She cites as an instance "Smug," the trade name of a clock case she designed for Warren Telechron Co. It was developed in yellow or orange plastics. "These colors," Miss Kogan states, "could not have been introduced in wood or metal with the same results. They would have lacked the luster and quality inherent in plastics."

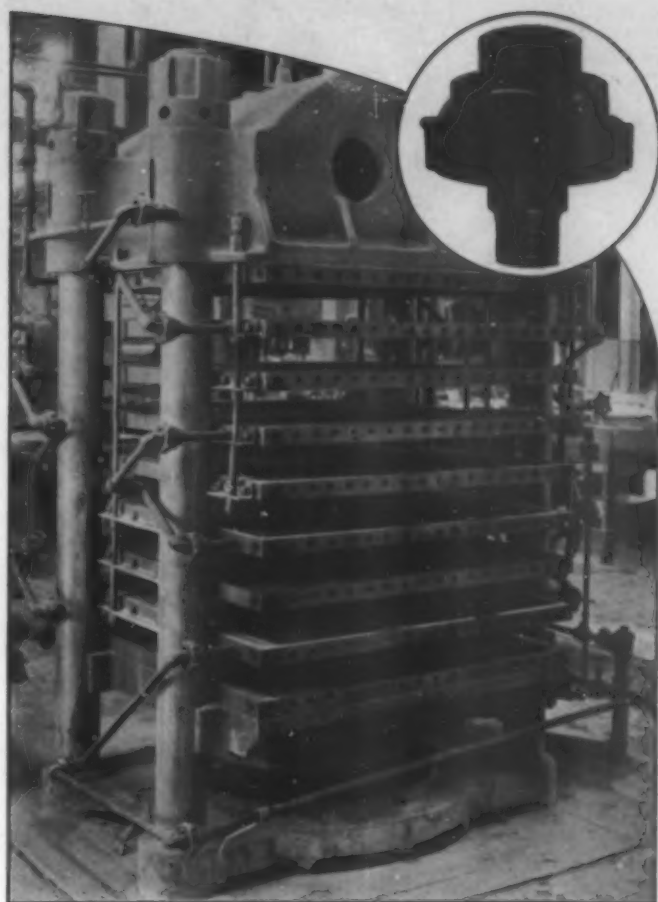
"At this time," she says, "large objects for molding in plastics must be considered from the standpoint of costs and the practicability and efficiency of tools. When these problems are definitely solved, and when the design job is placed before the industrial designer, he or she will be ready to work it out."

Miss Kogan has designed in wood, metals, glass, porcelain, and china, in addition to plastics. And she believes that basic materials are undergoing a steady change in their application to every-day articles. They are being switched into different grooves as design trends change, as women demand new and different things. And each material must quickly find its proper niche in a world demanding the modern. Unquestionably, plastic materials are well on their way to becoming one of the major factors in manufacturing in mass production for the popular priced market.

Costs cut, steps saved, through molding

(Continued from page 15) heavy metal stamping would be required to give strength, a special phenolic impact resistant molding material for the base provides the projector with lightness in weight combined with the necessary strength to resist rough handling.

A second special molding material was used for the lamp housing. This material has high heat-resistance and confines the heat generated by the 100 watt lamp within a limited space. The production of this projector furnishes another example of the value of plastics over other materials in the manufacture of precision instruments. Credit: To Spencer Lens Company for the molding. To Bakelite Corporation for the special phenolic molding material.



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Barco Joints permit free 360° swivel movement. They will not leak under the rapid temperature variation, alternating steam and cold water. Gaskets cannot blow out and their long life contributes trouble-free service to low maintenance costs.

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Indestructible playing cards

(Continued from page 22) sheets were developed and playing cards were made of them about fifteen years ago but, unfortunately, although they had good wearing qualities they were far from perfect. The main difficulty was encountered in the printing—it was unsatisfactory. It wore off. Furthermore, the cards were translucent and subject to warpage so that eventually the attempt to make them was abandoned.

Along about this time Ely Culbertson began his search for a perfect deck of playing cards. This search brought him in contact with Siegfried Klausner, a very ingenious and imaginative Viennese chemist. Klausner understood Culbertson's objective but recognized the difficulties it uncovered. Together, they took the problem to the Celluloid Corp., whose research laboratories soon placed at their disposal a special formula of Lumarith, a cellulose acetate material. This new material soon proved to possess the qualities desired with none of the former objectionable features.

Special formulations of inks and methods of manufacturing had to be evolved by Culbertson and Klausner, but the results of their efforts have been successfully crowned, some thirteen years since their search began, in the creation of Kem Playing Cards.

When Kem playing cards made their first appearance in one of New York's department stores, advertisements appeared which, to the ordinary consumer not knowing the true character of the cards, seemed to make rather extravagant claims. They were advertised as "Indestructible Playing Cards" to which the public promptly cried, "Impossible!" They looked exactly like any other cards, yet they would not stain, were hygienic, moistureproof, would not crack when bent, would not nick or mark, were resilient, wonderful to play with and above all, washable. Although Kem Playing Cards were considered high priced, it was claimed (and later substantiated by factual proof) that in the long run they were cheaper and out-lived the best and most expensive types of paper cards ten times over. The public took to them immediately, and Mr. Culbertson had made another grand slam. The Kem Playing Card Co., Inc., with which he is associated, has been swamped with orders ever since.

It is difficult to realize the many problems that faced Culbertson, Klausner and Celluloid Corp. in developing the special type of cellulose acetate sheets. It was a struggle which found encouragement in the enthusiasm and the acumen of Culbertson who foresaw its possibilities. The first problem was to develop a type of material which would lie flat. That is, one that would not warp when cut into small rectangles and held in warm, perspiring hands. The second, was to produce a surface that would react to the printing of the symbols and backs, yet would resist stains and smudges. They were so successfully solved that a bottle of ink may be spilled over the new cards and no damage result. A quick bath in cold water and the ink is removed. As to their ability to resist germs, the University of Vienna found that microbes actually thrive and fattened on the paper card, while the cellulose acetate card surface went germfree. They are impervious to weather, and will not stick together on damp days. Moreover, they are really beautiful to play with and to see. They are being made with the traditional

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DECEMBER 1935

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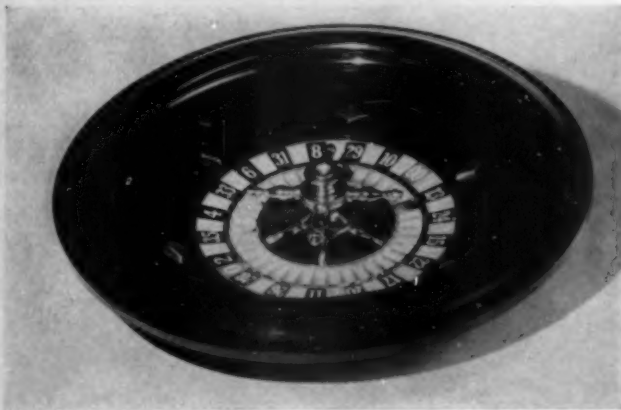
scroll patterns and elaborate art work associated with cards for many years, and are available in a complete range of color and color combinations.

Since their presentation last spring, their use has spread amazingly. Retail outlets reported good sales during the summer, which is usually a poor card season. The beauty of the cards and their attractive box of molded Neillite, together with a price range not usually associated with cards, has created a market for them in exclusive specialty and gift shops. Stories told of their wearing qualities are prodigious. "Crockfords," one of the big bridge clubs, recently returned a deck by request to the Kem people. It had been used for 15,000 deals without any visible signs of wear.

When the wheel turns

(Continued from page 19) sheets are cut into rods and shipped into the shop where they are sawed into cubes a few thousandths of an inch larger than the finished dice are intended to be. In this condition, they are allowed to cure or age anywhere from two to five years before they are machined to size. This is done in order to complete all possible shrinkage and to develop hardness throughout the material. These cured cubes are then machined with diamond pointed tools on machines designed and developed by the company in its own shops.

When the cubes have been cut to size, holes are drilled for the spots. Each hole is individually drilled using the same drill point, which is equipped with a micro-matic adjustment to insure the exact depth in each



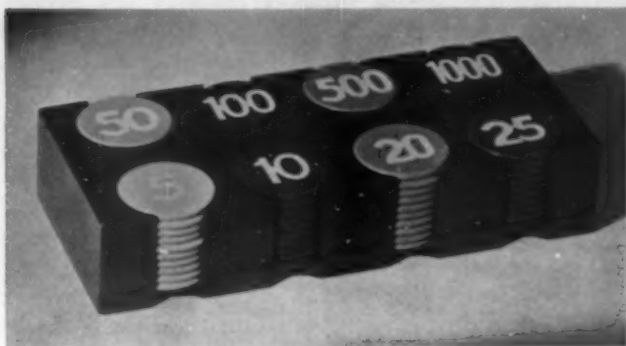
Small roulette wheel with molded plastic bowl for home use of the type to be molded by Mason & Co. when its new presses are installed

instance. Surfaces are then ground with liquid abrasive in much the same manner as lenses are ground in an optical factory. Next, the cube is calipered at each corner of its six faces and any variation in thickness is adjusted by hand grinding of the spot at fault. If a high polish is desired, the cube is buffed but the majority of users prefer a slightly dull finish that will not cause glare.

There are two methods of finishing the spots. One leaves a slight concave in the whitened surface; the other is filled flush with the surface of the dice. Either way, the "white" is of the same material as the dice and is applied in liquid form with a tiny brush by a circular motion of the hand which eliminates any pos-

sibility of air bubbles remaining in the surface. This material cures in two or three days and becomes an integral part of the dice, seldom showing any sign of wear even after long usage. After the spots have cured, the dice are returned to the grinder where they receive a final finish.

Each completed die is placed in a micrometer for a final check-up and each of its six surfaces is measured



Club markers in different colors for various amounts frequently required with special designs or private monograms and insignias. The holder illustrated is of wood but will soon be molded by Mason & Co. of plastics.

before packing in pairs or sets. If this check-up shows a variation of more than two ten-thousandths of an inch, it goes back for adjustment. When you consider that the average thickness of a human hair is between thirty and fifty-thousandths of an inch you can easily visualize the accuracy and precision with which these dice are made.

Of course, there are many sizes and shapes of dice, all made with the same degree of accuracy and by practically the same methods, but the good old-fashioned "come seven, come eleven" kind turned out by Mason & Co. is balanced more accurately than any one, aside from a professional, would suppose.

Because checks, or chips—whichever you prefer to call them—do not require as close tolerances as dice, they can be molded successfully by conventional methods. But there are as great differences between types of checks as between molded and precision dice. Perhaps you have had occasion to play with checks that don't stack. Almost anyone who has sat in at a Saturday night game knows how easily the stacks of checks tip over and spill. Even if you haven't had a stack of your own high enough to spill, you have seen it occur to the embarrassment and annoyance of other players.

Professionals demand checks that will stack well and remain stacked, yet permit being separated quickly or picked off for play. At roulette, players' checks stacked on a number must be capable of being raked without upsetting. Since the "pay-off" is also made in stacked checks, they too, must be raked along the lay-out, reaching the winner in convenient formation. This is true with other games, each having its individual peculiarities of play. Checks must be designed and produced within accurate limitations to meet demands of actual use under rigid and exacting conditions.

Chips, or checks, made by Mason & Co. come in a number of stock patterns, yet millions are made with individual designs on special order. Each club or casino has its own ideas about this and their demands

INSTRUMENT KNOBS for use in testing equipment



Knobs and dials often make or mar the entire appearance and performance of a machine or instrument. The design and finish affect appearance; accuracy controls their operation. Thus it means something to know that Kurz-Kasch Knobs are standard equipment on many of the finest American products.

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are very exacting, both as to design and finish. Wealthy individuals often go to the expense of having monograms or signatures inlaid in checks for personal use. Club markers for varying amounts are frequently personalized with the monogram or insignia of the club.

The materials from which they are made are as carefully compounded as any used by the electrical, or other equally technical industry. A shellac compound is used with cotton flocks added for strength, and mica or similar material is included to give the proper weight and tactile quality. Surfaces vary with the purpose of use intended, but few chips with a plain glossy finish are made by this company because they do not stack well and upset too easily. A slightly machine or sand-blast finish is the general preference and is accomplished in the molding without any additional labor operations. Edges are carefully chamfered in the finishing process so checks will slide easily on felt covered tables without injuring the nap.

A battery of more than a dozen presses, running three shifts a day, is required to turn out these checks during busy seasons. Department store merchandisers have discovered recently that there is a difference in checks and that they can sell those of superior finish and construction in greater quantities with better profits. This means that more presses must be added to take care of increased production. It means, too, that since this additional business is even more seasonal than regular business from clubs and casinos, there will be times when all the presses will not be busy. With this in mind, Mason & Co. plans to keep them occupied by molding other small stock items, and with added presses of greater capacity, more of the items within its line will be molded of plastics instead of being made of wood.

Jewelry prefers resins

(Continued from page 41) moreover, but carry out definite fashion trends. It is their very adaptability to style influences that has brought cast resins to the fore in this field. A trick dagger fastener made of cast resin emphasizes the military flair. It is a silver capped miniature dagger of two-toned cast resin, chained to a resin semi-circle. The dagger slips into a metal loop like the frog fastenings of a guardsman's dress uniform.

The English Jubilee inspired another smart button motif. It is a cunning miniature bell of cast resin, an inch long, with a minute silver metal tongue. Elaborate carving and metal combinations give us the rich detail of the Renaissance.

Chic and adaptable as it is, cast resin naturally takes its place as the logical accessory substance, in a season when emphasis on accessories is more marked than it has been since the fashion world became accessory conscious a few years ago. Lightweight, colorful, durable, cast resins rightfully hold their place at the top of the accessory field.

Predictions of a chemical engineer

(Continued from page 28) moisture. The industry is due for an ever increasing competition from pressed fibre and synthetic resinous products unless some new and better product is put on the market. In short, the

ancient art of plywood construction must give way to the science of veneering or laminating of woods.

The early stages of the industry grew out of a desire to make a little valuable wood surface a larger area of inferior woods. It was soon found that such a laminated construction added to the strength and resistance to warp and splitting of the fabricated article so long as the bond fastening layer to layer remained intact. This bond, then, became the focal point of weakness in the finished product. Engineering control of the moisture content of the sliced, sawed or cut veneers yielded a more uniform article. Animal glues proved too soluble in water and were replaced by vegetable glues. These in turn gave way to the still less soluble casein and highly insoluble blood albumen glues.

This development in glues has demanded new engineering equipment to bond the surfaces. The more soluble types of glues have acceptable results after cold pressing in wooden frames, using wood wedges to exert the pressure. Hot pressing, necessary with blood albumen calls for simple hydraulic or electric presses, heated with steam or electric platens.

As bonding agents

Such equipment readily suggests the use of thermosetting synthetic resins as the ultimate in waterproof bonding agents. Experiment has demonstrated that their resistance to moisture is many times that of casein glues¹. For many years these resins have been recommended for superior moisture and vermin proof bonds^{2, 3}. Cost and mechanical difficulties have deterred but not prevented the production of plywood with resinous adhesives.

To date most progress in this line has depended upon the phenol-formaldehyde type of resin. First, it was applied in the form of an alcoholic solution³. Later, the "film glue method" of McLain⁴ was employed with some success. By this method a material, usually paper, was impregnated with a solution of the resinous adhesive, the solvent evaporated and the paper plus adhesive films used as the bonding material. More recently the resin has been applied in dry form to surfaces wet with alcohol^{5, 6, 7}. Other methods call for spreading a water emulsion over the surface^{8, 9}, for spraying fine particles through a flame¹⁰, thus causing a superficial melting, and for spraying an acetone solution of the partially precured resin¹¹. Other types of resins such as vinyl¹², urea-formaldehyde¹³, as well as mixtures of glue and synthetic resins¹⁴ have enjoyed less extensive developments. This seems to be due, at least partially, to the cheapness of the phenol-formaldehyde type. Price consid-

¹ Stout and Collins, Modern Plastics 12 (10), 42 (1935).

² Traux, U. S. Dept. Agr. Tech. Bull. 205 (1930).

³ Beekeland and Thurlow, U. S. Patent 1,019,408 (1912).

⁴ McLain, U. S. Patents 1,299,747 (1919) and 1,343,216 (1920).

⁵ Merritt, U. S. Patents 1,978,807 (1934); 1,980,216 (1934).

⁶ Merritt, Trans. Am. Soc. Mech. Eng., WDI-55-3, 17 (1933).

⁷ Brill, F. E., Plastics, 7, 689 (1931).

⁸ Dent, U. S. Patents 1,894,088 (1933); 1,917,020 (1933).

⁹ Sontag and Norton, Ind. Eng. Chem., 27, 1114 (1935).

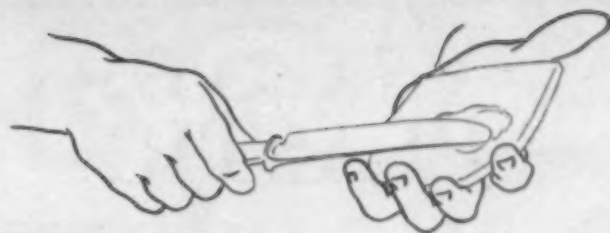
¹⁰ Kienle and Adams, Brit. Patent. 354,544 (1929).

¹¹ Stout and Collins, reference 1.

¹² Fife, U. S. Patent 2,000,383 (1935).

¹³ Pollock, Brit. Patent 181,014 (1922).

¹⁴ Arnot, Brit. Patent 225,953 (1924).



As much of a necessity as Bread and Butter

Instruments are no longer a luxury in the Plastic Industry. Demands for accuracy of form, maximum toughness and perfect color match have changed rule-of-thumb methods. Cambridge Pyrometers used for taking mold temperatures instantly pick out too cool or overheated surfaces. This inexpensive instrument will pay for itself over and over again in reducing spoilage and producing a better product. Cambridge Instrument Co., Inc., 3732 Grand Central Terminal, New York City.



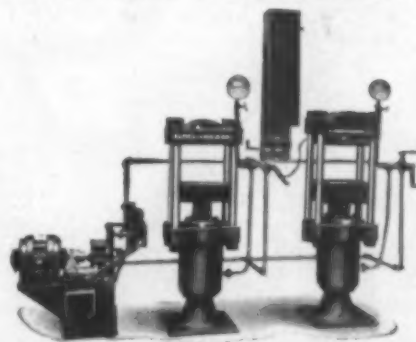
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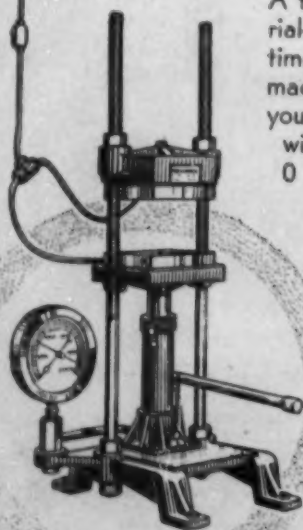
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erations and molding conditions are distinctly in favor of the last mentioned system.

This brief resumé of progress in the use of synthetic resins for bonding plywood shows that much of the information exists in the form of patent claims. Recently a few excellent articles of a general nature have appeared to acquaint the general trade with the commercial possibilities of the field. At present synthetic resin adhesives are priced about the same as other glues⁹. However, their use necessitates more elaborate and expensive engineering equipment.

Hot pressing is important

Some of the men most vitally interested in wood working industries today consider hot pressing the stumbling block to the use of thermosetting synthetic resin adhesives. The writer has been told by such men that hot pressing must be eliminated if a general adoption is expected. These men in responsible charge of production and sales must realize that this application of pressure at elevated temperatures encourages desirable chemical reactions to proceed at reasonable rates. These desired chemical reactions produce a durable, insoluble, difficultly fusible adhesive. The very nature of the desired end product demands something more than mere "glueing." On the other hand, if these desirable chemical reactions proceeded under ordinary conditions of temperature and pressure the probability is that they would continue past the optimum point and cause an early failure of the bond. In short, the process which involves thermosetting provides a controlled period of chemical reaction after which the temperature and pressures are dropped and the rate of the chemical reaction falls to a negligibly low value.

Hot pressing, therefore, must be accepted as the fundamental unit operation of the new process. How to carry out this operation best is a pertinent question. Industrial practice requires the fabrication of sheets at least six feet in length. To provide an even heat distribution and uniform pressures is a real engineering problem. Some operators recommend presses large enough to accommodate a number of individual panels with each pair of panels sandwiching an electrically heated platen. Others suggest a series of rolls to exert the required pressure upon the preheated panel material. These engineering methods have their counterparts in other fields of practice, and it is doubtful if any one process of hot pressing ever meets a universal acclaim. Moreover, it is highly probable that some engineering practices now used in other industries may be adapted to this thermosetting operation and advance its effectiveness.

However, hot pressing is the first operation that must be perfected or stabilized. Once this practice is agreed upon the relation of moisture content of the unglued panels to the molding temperature, pressure and time can be evaluated. These variables, in turn will control the moisture content, compression losses and general working characteristics of the finished panel of plywood or veneered surface. In short, pressing practice defines the drying, adhesive application, humidifying and finishing practices that must precede and follow it in the manufacturing cycle.

Some men in the wood working industries declare

most emphatically that this is not a propitious time to advocate so radical a change in industrial practice. They point out that the business has been "in the red" for years and that no funds are available for such drastic engineering changes. It is true that it takes a brave man to launch an ambitious program in the face of such odds. History tells of one commanding officer who found himself and men surrounded and "in a bad mess." When asked if he surrendered he responded with some suitable epithets that he was just ready to advance. Morose consideration of red inked ledgers of past years will not overcome the new competition which has come to stay. Bemoaning the lost prestige of the "art" will not develop new markets. Competition must be met with new products, superior products that will again restore the pride of ownership for articles fabricated from wood.

Superior products

Engineering developments of this sort must not disregard our present state of ignorance of certain fundamentals. Development of superior plywood products will necessitate numerous advances in our present state of knowledge of the subject. Wood must be vermin proofed. This problem alone is sufficient to cause lengthy argument. This vermin proofing must not interfere with the finished appearance of the end product. It involves the deposition of chemicals upon or within the very fibres of the wood. The sooner that guaranteed products can be offered to the trade by responsible companies, the sooner will the industry be on the real road to recovery.

This deposition of chemicals on or within the fibres of the wood suggests a problem which is under investigation in the author's laboratory at the present time. We know little about the true nature of the bond which fastens one layer of wood to another. The differences in the physical structure of woods would lead one to predict a profound difference at the wood: adhesive interface. It is felt that a critical study of this boundary will yield information which will be of value both in predicting satisfactory bonding conditions and in explaining well known failures. Obviously humidity of the wood, presence of vermin proofing chemicals as well as the basic structure of the wood itself may alter the nature of the adhesive interface. In this connection it should be remembered that vermin proofing may follow hot pressing when synthetic plastic resins are used to affect the bond. In other words, there is no reason why vermin proofing should not come at the point in the process that will provide optimum conditions for bonding. When such a critical study of the focal point of weakness in the plywood industry is available the industry should be able to proceed with an added degree of certainty and confidence.

When a superior product has been provided for the wood working industries it is evident that an equally superior clear finish must be available. The older types of clear varnishes leave much to be desired. They mar and stain quite easily, despite advertisements to the contrary. A number of progressive manufacturers have interested themselves, in recent years, in the new synthetic plastic types of resins as a basis for varnishes.

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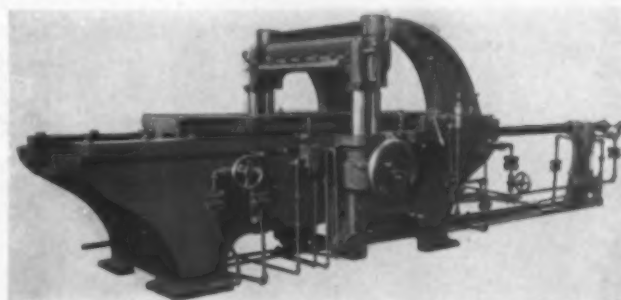


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Enough progress has been made in these lines to convince one that here, again, synthetic plastics can help the wood working industries and that the wood working industries can stimulate the production of superior finishes. There is a strong incentive to produce a quality finish for a quality product. On the other hand, our present finishes probably are as good as the articles that receive that finish.

Permanent protection

It takes little stretch of the imagination to vision a piece of fine furniture, a fine grade of wood trim or any high grade article of the wood worker's art supported and protected by films of synthetic resins in such a manner that the beauty and integrity of the venerable material of construction has been maintained. Moreover, one may say without the slightest hesitation that the proved superior quality of plywoods bonded with synthetic plastic resins as well as the decrease in the length of time in which materials need to be held in the process of manufacture, offer excellent arguments for continued research both along chemical and mechanical lines. (Acknowledgment: The author is indebted to Mr. William Brew for checking most of the references made to the literature.)

Automobile gossip

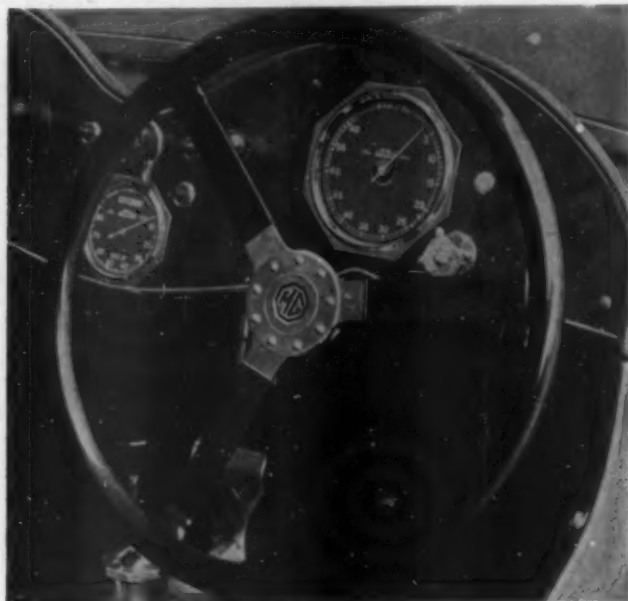
(Continued from page 14) running at 60 to 70 miles an hour. In order to get this acceleration and rapid speed with a reasonably closed throttle, the figure of 100 m.p.h. was set arbitrarily. Within a week, much to the surprise of everyone, this engineer had increased the speed of that model to 96 m.p.h. which was sufficient.

Plastics should not be considered merely as substitutes for other materials they replace, asserts Mr. Spring, but the interior trim of the car should be designed to accommodate them in their most desirable and available form, probably along modern lines. In his opinion, automobile manufacturers are not taking full advantage of the materials in that way. He believes, too, that pearlescent effects should be interesting to automobile manufacturers but so far they haven't been produced satisfactorily. The use of the word "streamline," which at present is more or less of a misnomer, may result eventually in the actual production of articles that are really streamlined and this applies particularly to the automobile. True streamlining requires curved glass for rounded lines. The thing most desired in the automobile business today is a curved windshield which will form a complete half circle. If this can be developed in plastic materials, capable of being bent or shaped and yet as transparent as glass, it will be adopted promptly because it will be safer, lighter and better in every way. If plastics research men were to start now to evolve this type of clear, transparent plastic, they would find a big demand for it as soon as it was ready.

Variables are among the greatest difficulties in manufacturing automobiles. The two hardest to control are paint and trim. There is a vast difference, too, in makes of upholstery, even in colors and textures of two bolts of goods from the same maker. There is, in fact, less uniformity of the upholstering and trim

than in any other part of the car. One man given a bolt of goods and a mouthful of tacks will do an entirely satisfactory job of upholstering on one seat while another man with a piece of the same goods and another mouthful of tacks will build a seat so hard and uncomfortable that it sometimes has to be returned to the shop to do over. Hand labor is the thing that causes variables and this is equally true of the paint and finish. It is not unusual for one "hard luck" car to go back to the paint shop two or three times to have scratches removed. All these things interfere with the production problem which this year is going to be a serious one to most manufacturers. Mr. Spring says there is considerable doubt whether more than fifty per cent of Hudson's orders can be shipped this year in spite of increased production facilities, as more business is booked right at the moment than in 1929.

"Plastics might help to reduce the variables to an appreciable extent," declares Mr. Spring, "because they, like the mechanical details of automobile construction, can be controlled. This objective might be accomplished by a more extensive application of plastics in interiors to replace paint and upholstery."



Instrument panel of the M. G. Midget Bugatti is laminated resin impregnated plywood with beautiful graining. Knobs and controls are of molded material.

Oliver Clark, Chrysler engineer, believes there are many possibilities for the use of plastics in the manufacture of cars, because of the way they lend themselves for finishes and decoration. "Plastics are coming," says he, "as sure as shooting."

"Garnish moldings have been considered from time to time," continues Mr. Clark, "but because we have always made them of metal which is rolled out thinly and quickly and automatically welded to the body structure, we seem to continue to use them from tradition. There is probably no reason why garnish moldings should not be molded of plastics for it is very definitely possible to carry out modern color schemes through the use of plastics with inlays such as black with chromium stripes which could be carried not

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Pyrocon taking plastic material mold temperatures.



alone through the instrument panel, but through the garnish molding, kick plates and other interior trim as well. This has not been done, probably due to the fact that automobile manufacturers have not caught onto the tricks of designing for plastics. Their set-up calls for metal which they know how to handle. Some attempts to substitute plastics have been unsatisfactory because of lack of experience in utilizing tricks in design to make it successful."

Garnish molding in comparison with steel would be fairly expensive, although Mr. Clark admits knowledge of such experiments now being conducted by one automobile manufacturer which will, no doubt, be worked out successfully before long. He considers that plastics in instrument panels would be an advantage because of their insulative value and because they are light in weight. Asked why door handles and cranks that raise and lower windows were not made of plastics, he said: "Those are things we buy from others. Our business is to make automobiles and keep them going on the production line. When it comes to handles, all we want to have to do with them is push them on the car as it goes by on the line. The hardware companies design attractive hardware and make it practical for automobile use. They submit samples to us from which we make our choice. The numbers we choose for Chrysler, Dodge, De Soto, and Plymouth become ours exclusively. No other manufacturer may use them. So far, no manufacturer of plastics has submitted a line of plastic hardware for our consideration. I don't know that we would use it if they did. On the other hand, you never can tell."

Here again, it seems perfectly logical that, since plastics form the knob and escutcheon plate of such hardware, the crank could be molded with a metal core for complete harmony of the fixture.

Mr. Clark declares, "Plastics are undoubtedly on their way into automobile construction, not so much the wild eyed colors but those more conservative, especially blacks and browns that blend so well with current styles of decoration."

There is an evident attempt to harmonize interiors because the plastics already in use are in shades to closely match the grained metal of the dash and other interior trim.

"Packard has never gone seriously into plastics as decorative material," says Col. J. G. Vincent, vice-president in charge of engineering, "at least not as thoroughly as it might have. There are some pleasant possibilities in the way of vanity cases and interior trim, now made of wood for the senior cars (more expensive ones) and metal for less expensive models.

"One reason for this is because car styles change so rapidly and with them these interior fittings. With our superficial knowledge of plastics, we have felt that mold costs might be prohibitive although we have never really checked up to find out."

Colonel Vincent, in commenting upon the general business situation, expressed an opinion that we have not only reached the point of business recovery, but that the public has sated its appetite for low priced merchandise and that many who bought cheap cars during uncertain years are convinced that better cars are worth the additional investment. "This is not true of cars alone," he says, "but with clothing, furnishings and things for the home."

Edward Macauley, head of Packard's styling division, says: "I have discussed the matter of the use of plastics with my boys and we are in agreement at any rate, that our use of the material for instrument dials and horn buttons, and its possible use in connection with interior hardware, is about as far as we want to go at the moment. It is possible that this material will come into more widespread use and in larger pieces such as instrument boards or other large parts, backed up by steel for strength, but we are not sure of it at the moment. I consider its best use at the moment to be largely decorative."

To sum up the general impression created by the new 1936 cars: It is obvious that manufacturers have sought to improve appearance, comfort, performance, safety and economy in their products. Comfort and appearance, perhaps, offer the greatest opening for plastics in their construction. The driver's comfort has been sought by giving front compartments more room and freedom for operating, and new insulating materials are being used to keep them cool. Since there is no better insulating material than laminated plastics, it would seem logical that here is an opportunity for their very general use.

Aside from the many refinements of exterior design, there are countless innovations and refinements in body design as well. Body interiors have been given detailed attention comparable with intimate decoration in the home. Upholstering is brighter and color tones are coming in for greater care and selection than ever before. Since plastics are molded colors in themselves, is it not reasonable to expect them to be quickly recognized and employed in this general plan of improved interiors?

Colors of every hue have been used for exterior finish in the past, but with the approach of streamlining, smooth surfaces present a new problem which will be handled in new ways. Colors must be treated in a manner to bring out individual characteristics which have previously been emphasized through broken lines and two-tone exteriors. The soft lustrous surfaces and homogeneous colors of cast and molded plastics will carry these refinements throughout interiors in perfect complement to the progress made in construction and design. More than that—they will add years of life in the service they render to owners of these better cars.

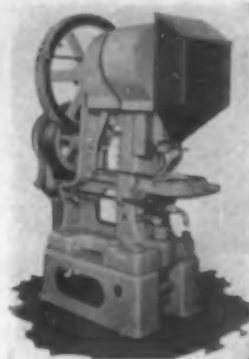
American laminated on British ships

(Continued from page 35) is of this material. The color chosen is pearlescent oyster shell white installed over mahogany plywood bulkheads with bright metal trim in keeping with the ship's modern appearance.

In addition to staterooms, architects of the Queen Mary are covering practically all furniture in the ship with a special blister-proof grade of laminated which will not spot with lighted cigarettes nor with alcohol and other liquids associated with food and drink. This includes the bedside table, dressing table, and chest of drawers in the first, second and third class staterooms. The color chosen for first class staterooms is mottled brown. Laminated will be used also for wall covering and table tops in the first, second and third class hairdressing shops. All tables in lounges, galleries, and public rooms throughout



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The "DDS-2" (above) is ideal for compressing preforms of molding compounds, for making buttons, closures, small electrical products, automotive parts, etc. Die fill up to 2 inches; maximum preform diameter 1 1/4"; capacity 350 pieces per minute. Equipped with patented Excess Pressure Release. Also economical and practical for moderate production because it may be operated with as few pairs of punches and dies as job warrants.

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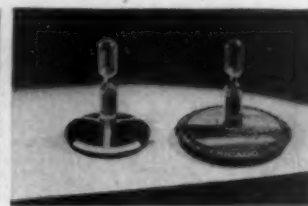
the ship will be covered with blister-proof Formica.

The material is available in nearly fifty colors and in inlays of one color over another. Being chemically inert, it is not injured nor spotted by any ordinary liquids and the blister-proof grades are immune to injury by careless smokers. The materials chosen for the Orion and Queen Mary are identical with those which have found widespread acceptance for bar tops and decorative purposes in the new cocktail lounges in hotels and restaurants in this country.

In addition to the Orion and Queen Mary, laminated materials have been used extensively in other British built ships, particularly the "Strathmore," "Abosso," and "Stirling Castle."

Hardy advertising perennials

(Continued from page 33) a long period of time and in a conspicuous place, it must have pleasing lines, rich lasting color and the ability to harmonize with other fittings likely to be found on the average business executive's desk or in his home. Plastics lend themselves readily to modern design, and offer the advantage of color that can't wear off. Furthermore, they look well with any decorative scheme.



16. These calendars, one combined with a thermometer and rocking blotter, are molded by the Northern Industrial Chemical Co.

17. Two long-distance phone call timers, produced by the Parisian Novelty Co. Lithographed pyroxylin applied over a metal base

Since the market is highly seasonal, the merchandise must usually be manufactured within the four final months of the year. If the calendar producer chooses to purchase his plastic cases and other parts, this seasonal factor does not increase his costs nor does it demand that production machinery lie idle for long periods of time. He buys in the open custom-molding or custom-fabricating market from plastics producers who devote their machinery to other purposes during the remaining months in the year. If, on the other hand, the calendar manufacturer molds his own, as is often done, the molding or fabricating of calendar parts serves to even out the irregularities of other plastics production throughout the year with resulting lowering of overhead and costs.

Plastics, too, offer an opportunity to vary design by change of color rather than by change of shape. It is possible to offer the customer a complete range of color choice without adding to the product's cost, for a single mold can accept any shade of molding material. When cast resins or pyroxylin are used, similar color variations are possible at little or no increase in cost. Obviously then, plastics—and particularly molded plastics—are an essential factor in the calendar-as-merchandise picture. Molded calendars are capturing a larger proportion of the total sales than

those made of any other material with the possible exception of metal. And even now, calendars and kindred devices once made of metal are fabricated of plastics—to achieve lower costs, faster production, wider consumer appeal and better appearance. The Bates Telephone Index device is a typical instance of this type of transition.

Calendars-as-premiums have been going plastic for decades. One of the first uses of Celluloid, back in the "seventies" when Hyatt was seeking markets for his new material, was for business cards. The material accepted printing and lithography readily and it possessed a strength and permanence far greater than that of the finest grades of paper. In fact, its wearing qualities were so great that users began to look around for some means of justifying the long life of the card—some means of inducing the recipient to keep and refer to it frequently. Calendars, printed on the reverse side provided the desired solution and to this very day are widely used. Inventive minds added other convenient features. Small rulers appeared along the edges of the card; small holes to facilitate typewriter erasures; gage holes related to the product advertised and similar innovations.

Familiar to everyone is the sign reading, "Doctor will return at . . ." a long-time pyroxylin standby. Among the countless other such devices have been found perpetual calendars, calendars for figuring interest periods, variations in the business cycle, relative profits at different prices and differences in time in various cities of the world. Another successful and widely used application includes the use of a pyroxylin strip on top of a blotter, usually printed with a calendar and the advertiser's message. Oil companies recently provided motorists with small tags for recording mileage and the date of their last change of oil.

In the field of more elaborate premium gifts, pyroxylin and metals have been combined. Light stampings form the shape of the item and highly decorative pyroxylin covers the exposed surfaces. One of the most ingenious gadgets is a three-minute time glass for timing long distance calls. Illustration or advertising matter is printed on the pyroxylin covering of the weighted metal base. Numerous thermometers, scales, paper hooks, etc., combined with calendars have met with definite success.

Reasons which make plastics desirable in the calendar-as-merchandise field, apply equally in the premium and gift field. Plastics are inexpensive—an essential consideration in widely distributed remembrance premiums. They are subject to infinite decoration and shaping, thus providing the novelty element so necessary to gain interest in premiums. Finally, plastics lend themselves to mass production with small lot identification changes permitting low fabricating cost for both large and small users alike.

Plastic premiums and gifts have reached a high point in consumer acceptance and appreciation. Those who manufacture and distribute them have demonstrated the possibilities of infinite applications. But the element of design is wide open to improvement where consumer acceptance will develop ultimately into consumer demand. The comparatively few fine and unusual designs invite manufacturers to step into a well developed market which unquestionably should not be overlooked.

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